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MEDICINE AND THE MEDICAL AGE

A Monthly Journal of

Practical Therapeutics

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ORIGINAL COMMUNICATIONS.

SYPHILIS FROM THE STANDPOINT OF THE SURGEON.

BY EDWARD MARTIN,

Professor of Surgery, University of Pennsylvania.

To the surgeon, syphilis is of import because of its prevalence; its protean clinical manifestations, which closely simulate tumors or the proliferation or destructive effects of other infections; and particularly because, unlike all other infection, its direct lesions are so consistently, effectually, and promptly bettered or cured by medication, that, with some exceptions, operative measures constitute a species of malpractice.

Hence to the surgeon the questions of incidence and diagnosis are major ones.

As to the incidence of syphilis, perhaps of many more or less convincing studies, Vedder's contribution (Bulletin No. 8 of the War Department, "The Prevalence of Syphilis in the Army") seems most applicable to local conditions.

A clinical examination of the West Point cadet corps failed to show a single case of syphilis.

The Wassermann survey indicated a five-per-cent incidence. From which it seems clear that from 2 to 5 per cent of the commissioned personnel of the army are syphilitic at the time they enter the service.

Since applicants to West Point are, physically, picked men, the prevalence of syphilis among college men in general is probably slightly greater than it is among the West Pointers. Moreover there is a distinct tendency for the percentage of syphilis to increase with advancing years: the older the group the higher the percentage. Vedder concludes from his study of a Wassermann survey of candidates for enlistment that about 20 per cent of the young adult male population from which the army is recruited are affected with syphilis.

In accord with this finding are the general results of a résumé of 100 cases taken at random from Dr. Stengel's service (medical wards of the University Hospital), it being his custom to have all admittances examined for the Wassermann reaction. Of this number 19 were positive. In two of these clinical manifestations might possibly have suggested the diagnosis of syphilis.

Thus if weight can be attached to this small number of cases entering the general medical ward of a hospital for the cure of diseases ranging from cholecystitis, renal sclerosis, gastric ulcer, and tuberculous pyelonephritis to goitre, and usually exhibiting neither characteristic history nor clinical signs of specific disease, nearly twenty per cent are syphilitic.

With one out of every five patients suffering from a chronic devitalizing infection, for we accept, as a working hypothesis, a positive Wassermann as a sign of active disease; and with a vaguely formulated yet fairly efficient therapeusis for this disease, it would seem well to consider it not only in its relation to individual lesions, but more broadly in its bearing upon the restoration of each individual patient to his highest possible standard of health.

Concerning diagnosis, the surgeon asks two questions: (1) Is the lesion under consideration syphilitic? (2) If not, has an underlying syphilis a distinct influence on

its progression, or upon the outcome of surgical intervention undertaken for its cure?

If these two questions can be answered in the negative the query as to whether the patient has or has not syphilis is of minor immediate moment, though it is true that the spirochete exhibiting a special predilection for the perivascular tissues and the heart muscle, by the devitalizing effect consequent on impaired nutrition, predisposes to all other infections, to neoplasms and slow ulcerative processes.

Concerning the first question, Is the lesion syphilitic? With the exception of the extragenital chancre, surgical intervention is rarely proposed for the relief of either primary or secondary syphilis.

Not infrequently chancre occupying other than its usual habitat is regarded as epitheliomatous, and excision is ordered; this particularly in the case of digital chancre as it affects medical men. It is painful, persistent, and atypical in appearance; and not until it has been cut, curetted, cauterized, and otherwise stimulated to wider growth, and usually not until the axillary nodes have been incised by a sympathetic colleague, does the patient come to "a man higher up." By which time even though spirochetes be not recovered from the ulcerating surface, a positive Wassermann, and often a secondary eruption, establish the diagnosis; which should have been made by the microscope weeks before.

The rapid evolution of chancre of the lip with the prompt and characteristic lymphadenitis is sufficient to exclude cancer. None the less some of these cases are operated upon; but the cutting of a wedge quite inadequate for cancer does no particular harm in syphilis, nor is the resultant deformity especially distressing except to him who carries it.

The major difficulty experienced by the surgeon is in the distinction between gumma and malignant tumor; a difficulty greater than ever before, since the profession is waking to the need of early intervention and sending tumor cases in the early stage of this development, when a differential diagnosis either from rate of development or physical characteristics is impossible.

Concerning bone swellings, *x*-rays give us even at this stage such pictures as usually enable us to determine with a fair degree of certainty the syphilitic, tubercular, or neoplastic nature of the enlargement.

No such help is afforded in tumor of the soft parts, and in the absence of a history or associated signs we have at our disposal wide excision and microscopical examination, the method of choice when such involve neither crippling nor gross deformity: or laboratory tests and the effect of vigorous antisyphilitic treatment.

Since the luetin test has not been helpful we depend upon the Wassermann reaction, placing much faith in a strong positive and none whatever upon a negative; looking forward with more hope than confidence to that day when the serologists, each renouncing his personal antigen and standardization, may unite upon a uniform method, sufficiently sensitive for human nature's daily food, but not subject to such vagaries as make possible a different report upon the same serum from each of three experts.

In the presence of a lesion which may be syphilitic, an active antisyphilitic treatment is started and pushed with a cheerful enthusiasm if the Wassermann be positive; with grim determination if it be negative. The treatment, usually by arsenic and mercury, the latter by inunction or hypodermically, is pushed to its limit. The limit of arsenic is shown first by polyuria, it being a vascular poison, later by a diminution in the quantity excreted. The limit of mercury is shown by proteid and casts, it being an epithelial poison; often before this it is shown by breath fetor and hypersecretion of saliva.

The limit of both or either drug is loss of snap and spirits, loss of appetite, loss of weight. To touch this limit lowers the patient's resistance, poisons him more than it does his spiral guests. Each patient has a definite dose which should always be short of the limit as above defined. Moreover the tolerance for these drugs is greatly in-

creased by sweating baths, free diuresis, and regular bowel evacuations, at least once a day.

If betterment does not occur within a week or at most two weeks, regardless of a positive or negative Wassermann, the lesion is considered as non-syphilitic and is so treated. The betterment of a specific lesion under well-directed treatment occurs quickly.

There are in our hospitals at this moment some thousands of patients perishing from the corrupting influence of a positive Wassermann upon the mind of the surgeon; drained by the steady progression of a condition which calls for prompt surgical relief, and even more actively sapped by the long-continued futile administration of mercury, arsenic, and iodide of potassium.

When the lesion is surely non-syphilitic though the Wassermann be positive, the question arises as to supplementing the surgical procedure by specific treatment; nor, if it be accepted that a positive Wassermann is a proof of active spirochetes, and that a harmless course of treatment will either quiet or kill them, would any but an affirmative answer seem logical.

The reason for not so answering and acting is based on absence of symptoms—meaning by this word gross functional or structural changes.

The earliest symptoms of any chronic infection, and this is particularly true of the spirochetal ones, are psychic, manifested particularly by an easier mental fatigue and unrefreshing sleep. Thereafter in weeks or months follow a lessened power and endurance of mental concentration, and often a change in temperament appreciable only by those closest to the patient. Later come gross psychic and physical derangements. Even in the presence of perfect mental and physical health a positive Wassermann indicates treatment, in the hope that it may change the positive to a negative, a hope rarely realized; in the belief that it may postpone or prevent later development of gross lesions and symptoms.

The positive Wassermann should be put on spring and fall treatment for life, or so long as his reaction remains positive.

PREVENTION AND LIMITATION OF DEFORMITY IN INFANTILE PARALYSIS.

BY ADOLPH COHN, M.D.,

Assistant Orthopedist to the Medico-Chirurgical Hospital; Clinical Assistant in Orthopedic Surgery to the Polyclinic.

The sacrifices offered at the altar of infantile paralysis will not have been in vain if it shall awaken the physician to a better knowledge of the prevention and limitation of deformity in this dread disease. The epidemic raging in New York will have its beneficiaries in the countless multitudes who may become afflicted with this disease, by creating general discussion as to means of prevention, as well as treatment of this disease soon after its inception. It has been my experience that cases of infantile paralysis brought to the orthopedic clinic rarely come with a diagnosis of having had infantile paralysis, but give a history of having had pneumonia, rheumatism, malaria, summer complaint, severe attacks of fever, and the like. These histories, as a rule, are a commentary on the work of the physician handling the case, although occasionally the cases are neglected and treated by the parents with so-called home remedies prescribed on the advice of the druggist or neighbors. (This is particularly true in the poorer sections.) While we recognize the difficulty of early diagnosis, especially in sporadic cases, it is of importance to bear it in mind.

When a physician is called to see an infant or young child presenting the symptoms of fever accompanied by pain in the back or extremities, particularly in hot weather, he should interest himself in the ultimate outcome of the case. The physician need not be an alarmist, but in a tactful way might explain the possibilities and ask that he be notified if certain symptoms suggesting this condition be present. If he

find the case to be one of infantile palsy, then the amount and kind of deformity will depend largely on his skill in handling the case. Jones of Liverpool says: "By a proper appreciation of the available therapeutic and mechanical agencies we need rarely if ever encounter any paralytic deformity."

While I believe this statement a little too strong, I do believe the severity and nature of the deformity can be greatly improved by proper treatment. The general practitioner should not hesitate in calling an orthopedist in consultation any more than he would hesitate in calling a general surgeon in a pus or gangrenous appendix. To condemn a child to deformity for life, such as I have seen in some cases, is worse than condemning it to death, for some of these cases are a burden to themselves and to those on whom they depend.

Of the therapeutic measures rest (this includes the prevention of postural errors) is the most important; not comparative but absolute. If the trunk muscles be affected, for example, and the patient allowed to sit up too soon, it may result in some of the severest deformities of the back and pelvis. I well recall a case brought to Dr. Mann at the Medico-Chirurgical Hospital which was but "a human mass of putty." Such deformity as this child had could largely have been prevented and limited with intelligent care and treatment. The ambulatory treatment described by Lovett (*Journal A.M.A.*, Aug. 5, page 422) I believe is harmful and conducive to deformity. That the parts will regain themselves to a certain extent is well known, but how much power a given part will regain is impossible to tell and therefore the desire of the family to know how the patient is progressing. This leads a weak-willed physician to pay attention to the importunities of the parents and relatives permitting the child to use the parts too soon. "Because of the general muscular weakness and the unequal pull of the trunk muscles, the asymmetric methods of walking and standing and the faulty superimposed weight, or the one-sided use of the arms in cases of paralysis of the upper extremity, all motions tend to exaggerate the development of the deformity, when once under way." (Bradford and Lovett.)

During the stage of onset rigorous measures should be adopted in order to limit the destructive processes in the cord, this having an important bearing on the prognosis. I want to call attention to one measure in particular during this stage, and that is lumbar puncture. I believe a lumbar puncture, by reducing the pressure in the cord and lessening congestion, has a marked beneficial effect, and at the same time is valuable as a diagnostic aid. (Increased pressure in the cord is evidenced by spurting of the fluid on lumbar puncture, bulging fontanelles, and McEwen's sign.)

Active treatment should be commenced after the hyperesthesia has passed. Frauenthal recommends the D'Arsonval and Oudin currents soon after the onset, but I believe no advantage is to be gained, and I can only quote from a paper by W. J. Mayo that electricity has cheaply earned credit for benefits which time effects. Electricity is of benefit in the later stages, as I will mention in a subsequent part of my paper.

The surgeon rarely sees these cases until after paralysis is present. The stage of paralysis can be considered from the time the hyperesthesia and the contractions of the early stage have passed until the time when the power has been regained to as great an extent as possible. "Many of these contractures and deformities are preventable by the maintenance of the integrity of the muscle structure where weakness would allow overaction on the part of the unaffected opponents, and by plastic splints" (Frauenthal). The need of early detection of a faulty posture cannot be overemphasized. Jones of Liverpool believes rigid fixation of the head and spinal column in all cases (whether pain be present or not) should be carried out in accordance with the general principles which guide us in the treatment of an inflamed area. Splints if used, however, should not cause pressure and interfere with the circulation; for this reason plaster bandages that encircle the limb and splints that are secured by bandage

are inadvisable. Frauenthal recommends a light aluminum splint applied to the heel and plantar surface of the foot, projecting an inch or more beyond the great toe; this keeps the pressure of the bedclothes from the part and prevents toe-drop, the commonest deformity in these cases. A simple posterior wire splint run up beyond the knee and above the great toe can even be more serviceable.

We should now direct our attention to regaining as much nerve and muscle power as possible. This may be carried out by

1. Muscle training or reëducation.

2. Physical measures, such as (*a*) hydrotherapy, (*b*) massage, (*c*) electricity, (*d*) baking.

3. Mechanical apparatus.

Muscle training or muscle reëducation I believe to be the most important therapeutic measure at hand during this stage, and will be productive of invaluable results if properly carried out. The value of this work has been greatly enhanced by the use of the muscle test as described by Lovett and Martin (*Journal A. M. A.*, March 4, 1916). Muscle training is carried out by putting the part through passive motion in the direction desired. The patient is then told to make these movements voluntarily, the operator assisting to complete the motion. In this way as the muscle power increases the assistance decreases. These exercises are greatly improved if performed before a mirror as suggested by Frauenthal. Muscle training attempts to drive an impulse from brain to muscle in order to enable it, if possible, to open up new paths around affected centers in the cord (Lovett). This training must not be carried to the point of fatigue, but must be slow and moderate and gradually increased. Too much exercise is harmful, as evidenced by the muscle test of Lovett and Martin. In carrying out these exercises the assistance of an expert is advisable wherever possible; however, the constant, faithful assistance at home is preferable to expert attention at irregular and infrequent intervals.

Hydrotherapy: Warm baths are of value for a number of reasons. In the first place the circulation of the limb is stimulated and the hyperemia induced tends to counteract the trophic loss of the lesion (Frauenthal and Manning). Then, again, movements are better carried out with the limbs immersed in water, as the water supports the weight of the limbs. Splashing and kicking should be encouraged while the patient is in the water. However, these movements should be supervised so as to avoid postural errors.

Massage is of value in all stages after the subsidence of the hyperesthesia. It is beneficial because of the mechanical stimulation, and promotes muscular tone. Massage, however, like all good things, is often abused; it should be recognized that it is only valuable as an adjunct to other forms of treatment, and is not to be relied upon alone. Too much stress cannot be laid upon this point.

Electricity: Here we come to a therapeutic agent the value of which is disputed. The consensus of opinion is against early use during the acute stage. In the paralytic stage I believe it is of great value, if intelligently employed and in ethical hands. The currents employed may be galvanic, faradic, static, and high frequency. The high frequency and static are used for their influence on nutrition, while the galvanic and faradic are used for their effect on nerves and muscles. The electrodes should be applied to the origin and insertions of the muscles. The faradic current is used if the muscle responds to it by contracting, otherwise the galvanic is used until contraction is produced, and then the faradic is resumed. The current should be the weakest that will produce a contraction, and the treatment should be short, about one to two minutes for a muscle group. The galvanic current may also be used over the nerve trunks. The attendant should be tactful in giving treatments, especially to children, otherwise the fear of the treatment may interfere with its successful accomplishment.

Baking by the application of heat to a limb which is otherwise cold maintains the part in a state of warmth which is of benefit to its nutrition, and at the same time

renders the circulation more active, making a condition more favorable to muscular contraction. It soon becomes evident that this treatment permits the warmth and activity of the circulation to become more and more permanent as time passes.

Mechanical splints and braces are of inestimable value in infantile paralysis when properly used, but are detrimental when abused. The abuse is both on the part of the patient and the physician. The physician abuses braces by simply sending a patient to a brace-maker without specifying the requirements, leaving the matter entirely to the brace-maker. As Rugh said recently, "This is about as intelligent treatment as sending a case of pneumonia to the druggist and saying, 'Here is a case of pneumonia; give it the proper drugs.'" The parents or guardians are apt to abuse braces by believing that once a brace is applied they have fulfilled their duty to the case and have done all that is possible, relying on the brace to effect a cure.

Mechanical appliances to be satisfactory must be light, easily applied, inexpensive, and simple in construction. The purposes of these appliances should be (1) to prevent deformity; (2) to correct any that may be present; (3) as a means of locomotion and support.

Braces need frequent adjusting, and the patient should be impressed with this fact as well as that the treatment has just begun, as far as the brace is concerned, and not ended. If this were borne in mind many destructive operations would be avoided.

Operative measures for the limitation of deformities are in many cases necessary because of inefficient treatment. They should not be resorted to for at least two to three years after the disease has started. The paralyzed muscles have been found to regain power as late as four and five years after inception of the disease. Therefore early operation is an admission of inefficiency (in nearly all cases). When operation is necessary the procedure may be:

1. Tenotomy: The peroneal group of muscles being most frequently affected the commonest deformity we have is an equinus. When stretching or stretching and plaster cast is insufficient a simple tenotomy of the tendo Achillis is necessary.

2. Muscle and tendon transplantation: This procedure offers by far the most desirable result in limiting deformity. A sound muscle or tendon in the vicinity of the paralyzed muscle or tendon is necessary. Periosteal insertion (with silk extension if necessary) has been found more advantageous than tendon grafting—that is, insertion of a healthy tendon or muscle into a paralyzed muscle or tendon.

3. Destructive operations such as arthrodesis, resections of joints, and osteotomy are performed only when all other methods fail, or when the case is of long standing. Astragalectomy may be mentioned here as an admirable procedure in certain pronounced foot deformities; this operation is being performed where formerly arthrodesis was used.

4. Silk ligaments also have their advocates, and when successful are a good procedure.

5. Nerve transplantation may be mentioned as a promising procedure, but as yet sufficient work has not been done to make it common.

CONCLUSIONS.

(*a*) Importance of early and proper diagnosis.

(*b*) Advisability of consultation with an orthopedist.

(*c*) Value of lumbar puncture as an early procedure.

(*d*) Importance of absolute rest.

(*e*) Value of muscle training and muscle reëducation.

(*f*) Massage, hydrotherapy, electricity, and baking are of benefit when properly coördinated and carried out jointly with one another.

(*g*) Necessity of the physician being able to give proper instructions when desiring to have a brace made.

(*h*) Necessity of proper care of braces under physician's observation.

(*i*) Operative procedures as last resort after waiting several years, or because of lack of treatment or improper treatment.

(*j*) Muscle and tendon transplantation is the operation of choice wherever possible.

THE TECHNIQUE OF INTRAVENOUS MEDICATION.

BY EZRA READ LARNED, M.D.,
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The purpose of this paper is to direct attention to what the author believes to be the correct technique for the intravenous injection of medicinal agents, and to likewise call attention to the large number of medicaments that are being used in this manner, with reference to literature, where the subject may be studied in detail.

Medicine may be introduced into the circulation by a number of routes, such as the mouth, stomach, rectum, respiratory tract, veins and arteries, subcutaneous cellular tissue, and the integument.

One of the most satisfactory methods of medication is by the intravenous route, or direct injection into the venous bloodstream, but in American medical practice this has been reserved for emergencies, when other routes were not available, and where immediate action was necessary for the preservation of life.

The physicians of Italy, Spain, Portugal, France, and perhaps to a lesser extent Germany, have for years resorted to intravenous medication, not reserving this method for emergency work, but in thousands of instances making it the route of choice, because of its many conveniences. American physicians have not done so because their education has taught them to regard the blood-vessels, in fact the entire cardiovascular system, with awe, and because entering a vein has always been considered a dangerous and complicated operation. The illuminating advent of salvarsan has done more to educate American physicians to a proper attitude, and to familiarize them with intravenous medication, than any other one thing.

Medication by the subcutaneous route, by means of a hypodermic syringe, has been practiced in the United States to a very great extent, and doubtless every physician feels capable of applying this means with impunity, yet hesitates, through the fear engendered by early training, and augmented by lack of experience, to approach the intravenous, which possesses many advantages over the subcutaneous route, advantages alike to the patient and to the physician.

In one of the last editions of a noted work, which is used as a text-book in nearly every medical college in this country, occurs the following sentence:

"The intravenous injection of medicines is a method which is to be employed only under extraordinary circumstances, and with only a few drugs, as, for example, salvarsan in syphilis and quinine in pernicious malaria."

It is just this sort of teaching which has deterred the average American physician from making use of the simplest, easiest, and most satisfactory way of injecting medicaments. Our foreign professional brethren are far in advance of us in this respect.

Veins have been injected at the same point, or very close to the same point, more than fifty times, with no unfavorable consequences of any sort. The much-discussed danger of air-embolism has, I believe, been greatly exaggerated and is easily avoided. Eleven years ago (*Surgery, Gynecology and Obstetrics,* December, 1905) the writer called attention to the needless fear of air-embolism, and detailed a large number of experiments tending to show that the disastrous consequences of air-emboli were grossly exaggerated.

Abroad, the results achieved by remedies when injected intravenously are considered much more definite and excellent than when the same remedies are given by the mouth or subcutaneously. These opinions apply not only to morphine, strychnine, and other drugs ordinarily given subcutaneously throughout the medical world, but to such agents as iron, arsenic, mercury, and phenol, which, if not entirely, are still most usually administered by the mouth.

The Technique of the Injection.—The undressed patient, who has had no food for

several hours, should be in bed, in a recumbent position, either at home or in the hospital, with no pillow under the head. A standing or sitting posture during the intravenous injection may result in syncope. (See illustration No. 1.)

The skin over the median basilic or median cephalic vein, at the flexure of the elbow, should be thoroughly cleansed with antiseptic soap and water, followed by sponging with alcohol.

A suitable syringe, with a needle the shaft of which is no larger than 26 gauge or longer than ⅝ inch, should be sterilized by boiling and charged with the medicament to be injected. The arm, just below the elbow, should be massaged firmly with a downward stroke toward the fingers, and then firm compression around the arm should be made by means of an Esmarch bandage, a rubber band or tube, or, if these be not at hand, a firm cotton or linen bandage may be employed. The compressing material should not be tied, but merely held tightly by twisting, so that it may be instantly loosened by the assistant, who should be in charge of this part of the work; or the compressing material may be held by a strong artery forceps, which can be instantly loosened by the assistant, or the operator in case there is no assistant available. The object of the compression of the arm is, of course, to engorge the veins so that they may stand out prominently and so facilitate the operation, and to assist in this the patient should be directed to tightly clench the fist.

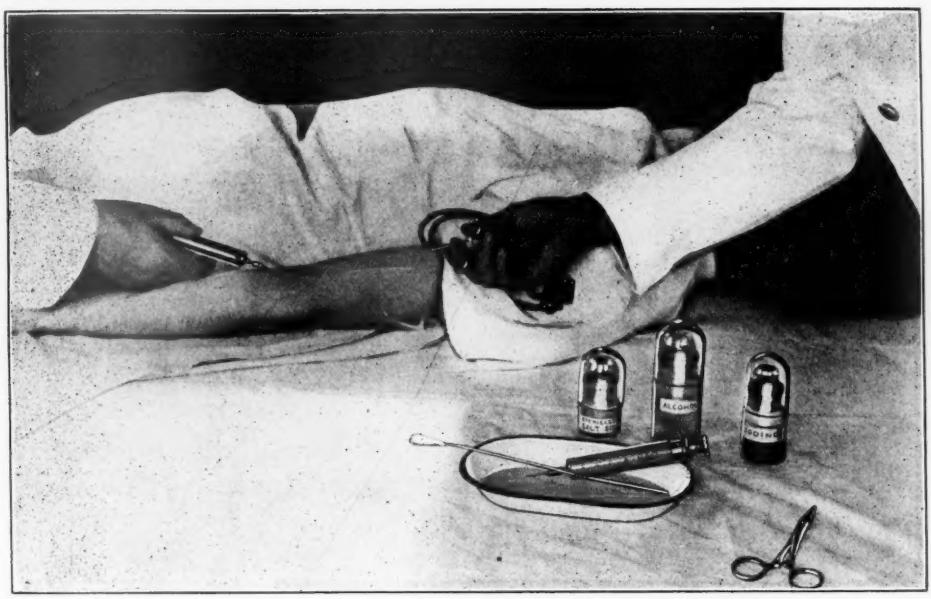
Although the median basilic vein is larger than the median cephalic, it is in close relation to the brachial artery, from which it is separated only by fascia, so that the danger of wounding the artery by an accidental transfixion of the vein with the needle suggests the advisability of choosing the median cephalic vein.

No. 1.—Proper posture for the patient.

The operator firmly grasps the arm of the patient with his left hand, seating himself comfortably at the side of the bed, or standing so that he is not in a strained position. (See illustration No. 2.)

With the filled syringe, from which air has been excluded, in his right hand, the operator places the shaft of the needle directly over the center of the vein, parallel

to its long axis, then points the needle toward the vein, holding it at a very acute angle to its long axis. Firmly, but gently, the point of the needle is then forced through the skin, with a lifting motion, until a sudden lack of resistance indicates to the sense of touch that the point of the needle has entered the vein. The needle should be forced through the skin and into the vein so slowly that there will be no possibility of wounding or piercing the distal wall of the vein by the added force produced by the lack of resistance when the needle pierces the peripheral wall.



No. 2.—Syringe needle entering the vein.

If the needle is thought to be in the vein the syringe should be held perfectly still for a few seconds, when the appearance of a small stream of dark blood running into the medicament will indicate that the needle is in the vein and everything therefore ready for injection. Some operators withdraw the piston of the syringe slightly, to induce the entrance of venous blood into the syringe, but this is unnecessary.

Others prefer to introduce the unattached needle, and after it has proven to be in the vein to then attach the syringe. This is not as good technique as the method described above and is more difficult. The danger of the needle slipping when attaching it to the syringe, or of transfixing the vein, is entirely avoided by the procedure suggested.

When the needle is in the vein, then the piston should be forced down with a screwing motion, turning it round and round, and pushing it forward gently at the same time. This controls the speed of injection much more perfectly than is possible by holding the syringe in the ordinary manner and making pressure on the piston with the thumb and counter-pressure on the barrel with the first two fingers. (See illustration No. 3.) There should be the slightest possible lapse of time between determining whether the needle is in the vein and the beginning of the injection. Much delay at this juncture may result in the coagulation of the blood in the fine caliber needle, which may be forced into the vein as an embolus when the injection is begun, a complication, of course, to be avoided.

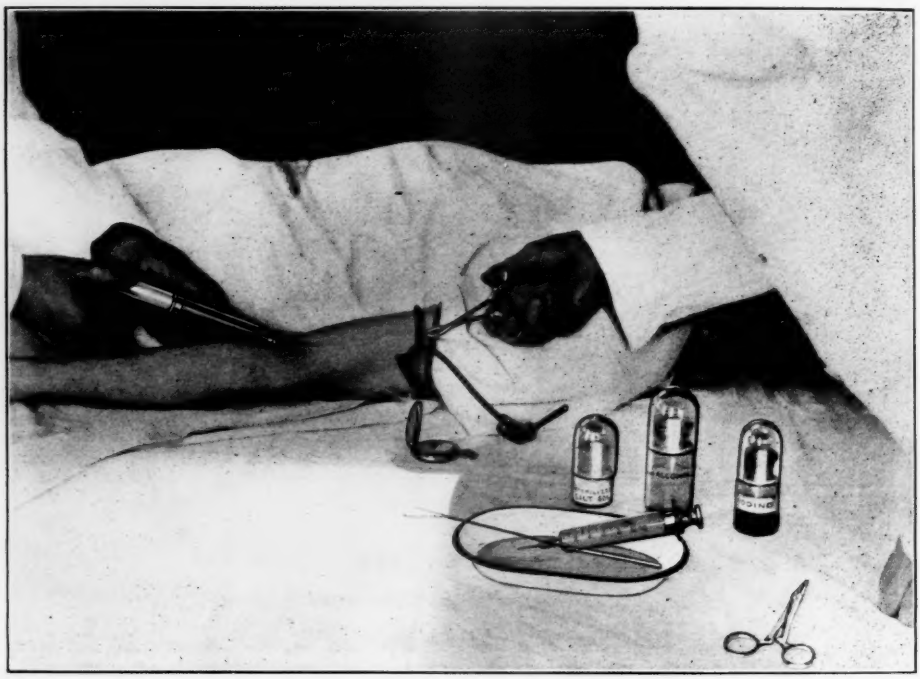
The actual injection of the medicament, however, should proceed with extreme deliberation and slowness, not more than 1 Cc. being injected in one minute. If more of the medicament than 1 Cc., in total quan-

tity, is to be injected, the rate of injection should be approximately one minute to each Cc. It would, therefore, require two minutes to inject 2 Cc., three minutes for 3 Cc., and so on. It is a great help to have an assistant check the time and indicate the speed of injection with the aid of a watch, with frequent promptings, because time seemingly passes very slowly under such circumstances, so that one minute seems like ten to the operator, as has been proven by many experiments.

The constricting bandage around the arm should not be released until the needle is in the vein. The injection should not be begun until the constriction is released. In other words, when the needle is in the vein, and the operator is ready to begin the injection, he should then, with his right hand, release the bandage or direct the assistant to do so. This should be done very carefully, however, so as not to disturb the position of the needle in the vein. When the bandage has been released the injection should be begun, but not before.

When a medicament has been injected the needle is quickly but gently withdrawn and the point of injection should be touched with tincture of iodine. It is not necessary to seal this tiny wound with collodion, although some operators prefer to do this. (See illustration No. 4.)

The patient should remain in bed in a recumbent position for an hour or two after the injection so as to disturb the cardiovascular system as little as possible. It is good practice for the physician to remain in attendance for perhaps an hour after the injection, or until all likelihood of any reactionary symptoms has passed.



No. 3.—Starting the injection.

In the aged, when the patient is weak or his condition bad, some stimulation at the time of injection is good practice. One-thirtieth grain of strychnine subcutaneously, or other stimulants, may be given as required.

It is the author's opinion that intravenous injections should never be given in the physician's office. The application of medicaments by the intravenous route, while a

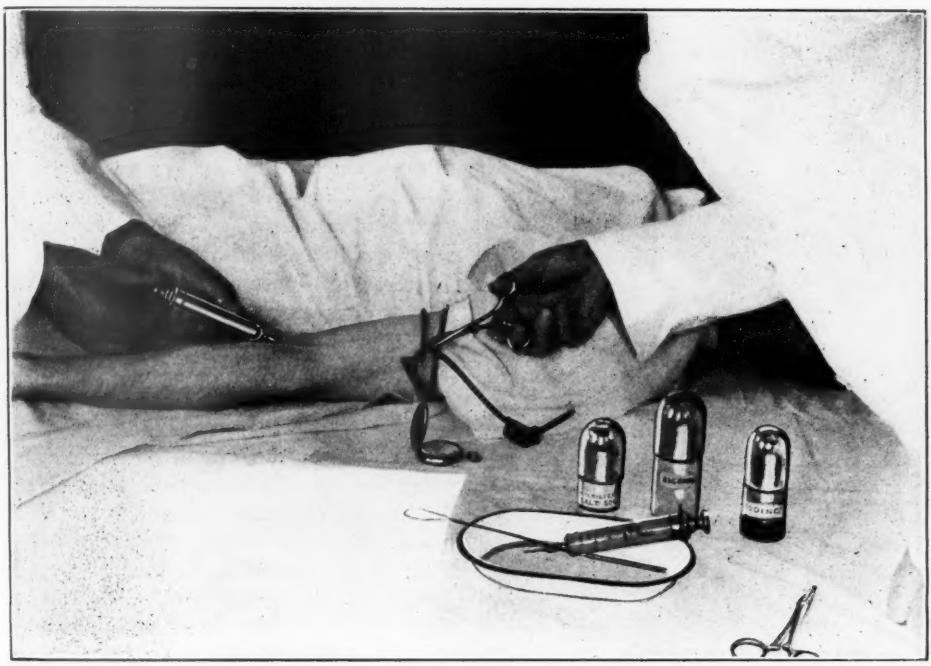
simple and almost uniformly satisfactory procedure, should not be lightly undertaken, but approached with due respect for the cardiovascular system.

The very finest needles should be used. The point of the needle should be perfect and its surface highly polished. It is far better to use a new needle every day than to risk one's reputation for skill by employing a blunt-pointed or rough-surfaced instrument.

If the solutions employed are sterile, the needles small in caliber, sharp, clean, and dry the syringe and the needle, preventing it from rusting, and keeping the instrument in good condition until the next injection.

Some medical text-books state that: "In some instances it may not be possible to puncture the vein without exposure thereof through an open incision, and it is much better to resort to the latter means in difficult cases than to run the risk of infiltrating the tissues."

The author has made many hundreds of intravenous injections and has yet to find an instance where it was necessary to resort to



No. 4.—Injection completed.

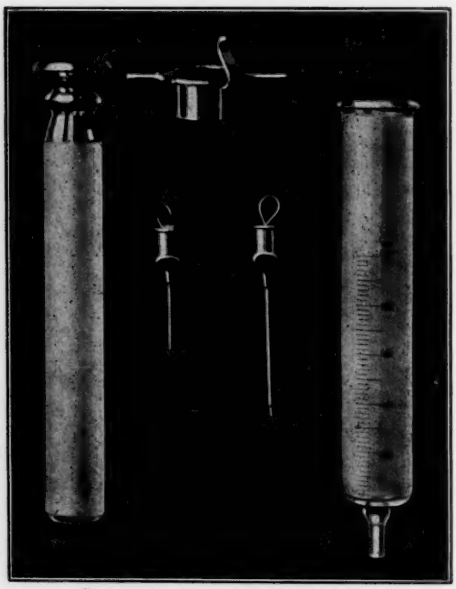
bright, the injection delivered into the blood stream, and not into the wall of the vessel or the tissues surrounding it, there is no danger of producing indurations or local reactions, and the satisfaction derived from making intravenous injections rapidly and confidently will be appreciated both by the administrator and the recipient.

After using the syringe, force out all liquid, rinse it with sterile water, and then with alcohol, including the needle in this operation, before returning the instrument to the case. Alcohol will serve to rapidly exposure of the vein. If, for some reason, as adiposity, veins in the bend of the elbow cannot be engorged sufficiently to make them prominent enough for the purpose, then a vein on the back of the hand, on the dorsal surface of the foot, in front of the internal malleolus, or on the anterior surface of the leg, may usually be found sufficiently prominent.

A little care, skill, and patience, combined with some experience, will invariably make it possible to perform intravenous injections without resorting to the possibly dangerous,

and far more complicated, surgical operation of exposing the vein through an open incision. The writer firmly believes that this operation is not necessary or justifiable more than once in a thousand times.

It is not unusual to read, in recent editions of standard text-books, the admonition to "inject a few drops of cocaine into the skin, over the point selected for intravenous medication, to render the operation painless." This is utterly absurd and entirely unnecessary. If performed as I have described it, the operation is painless. It is most unusual to have a patient complain of



No. 5.—"All-glass" syringe for intravenous injections.

pain, and it is nearly always the case that if asked the patients will state that they felt practically nothing. A properly made intravenous injection is immeasurably less painful than the ordinary subcutaneous injection.

By using a very fine needle, there will be no scars in the region where the injections are made. Where a great many injections are made sometimes patients complain bitterly at the slight scars, indicating the puncture marks, that remain where large caliber needles have been used. This may be more or less inconsequential, but the esthetic factor must be considered and the psychic element as well. This may be entirely avoided by the use of fine needles.

Kind of Syringe.—The great majority of syringes, while cleverly constructed, are not suitable for carrying out the principles of asepsis. Either they cannot be made sterile by boiling, on account of leather or rubber packing of the pistons, or they are easily disarranged, or are too complicated to be taken apart for cleaning. The simpler in construction the instrument is the better. The writer is strongly of the opinion that the ideal instrument for intravenous injection is the simplest of all in construction—*i.e.*, the "all-glass" syringe, which consists of but two parts, the barrel and the piston, both of glass, ground to fit closely. Such syringes are easily obtained of instrument dealers and are usually fitted with a slip joint, which is ground to a standard size so that needles which can be easily and accurately attached are readily obtainable. Most of these instruments are provided with a metal attachment which slips over the barrel, with projections for the fingers so that counter-pressure against the piston may be made. Some of the older designs are provided with a little chain and a wire clip, which is intended to hold the piston from dropping out of the barrel and thus becoming broken or septic. A recent improvement consists of a little spring clip which does away with the bothersome chain, but which holds the piston at the desired point. (See illustration No. 5.) So little pressure is applied that it does not interfere with the movement of the piston, but it is sufficient to prevent slipping, thus retaining the piston at any selected point.

The small syringes, known as "hypodermic syringes," are not so well adapted for intravenous technique as those of larger capacity, the writer's predilection being for one of at least 10-Cc. capacity, since it is desirable in many instances to dilute the solution for injection with physiological salt solution.

Filling the Syringe.—To the uninitiated, filling the syringe from the small ampoule may appear difficult and complicated, but in

reality it is quite simple; it merely calls for a little manual dexterity, easily obtained by experimenting in the quiet of one's office. The fluid in the stem should be shaken into the bulbous portion before opening the ampoule, and this is readily accomplished by snapping the finger against the ampoule while holding the stem upright. These ampoules come in various shapes, but in general they are quite similar. In some instances there is a file-mark on the stem, indicating the point of breakage; others have no such mark, but a small file is provided. I have seen some that have neither file-mark nor file, but in any event they may be easily broken by holding in the hand the bulbous portion of the ampoule, and then, with a piece of gauze or towel covering the tip, the stem can be broken off by a quick bending motion.

With the thumb and first finger of the left hand firmly grasping the ampoule, which is in an inverted position, the opening pointing downward, the needle of the syringe is introduced carefully into the opening. The needle should not be introduced far into the cavity of the ampoule, but only slightly inside the broken opening. The syringe can be held firmly in the same hand by making pressure with the third or little finger, or both, against the palm of the hand. The right hand is thus left free to gently withdraw the piston. This should be done slowly and gradually, and thus the entire contents of the ampoule may be withdrawn. Plenty of practice will insure against possible embarrassment. Before opening, the ampoule is washed off with alcohol or rubbed with a pledget of cotton dipped in alcohol. (See illustration No. 6.)

If the bottom of the ampoule is square or flat, or is provided with a little pedestal, it nevertheless must be supported in the manner indicated while filling the syringe, since proper needles for intravenous injections are so short that they cannot, by any possibility, reach more than half-way down in the ampoule, thus effectively preventing withdrawing all of the contents of the ampoule.

Drugs and Solutions.—It is of the highest importance that drugs, intended for intravenous injection, should be pure, reliable, accurate in dosage, sterile, and thus ready for immediate use. Probably every physician realizes that the method of making solutions for subcutaneous injection, by dissolving hypodermic tablets in ordinary water, and in vessels not previously sterilized, is open to the criticism of being techni-

No. 6.—Filling the syringe from ampoule.

cally unscientific and incompatible with the teachings of modern surgery.

A solution of a drug intended for intravenous use *must* be sterile, and sterile solutions, put up in hermetically sealed glass containers, are products that are instantly available and indispensable in emergencies. Consequently, the physician finds these most convenient because he may rely upon their safety, which he cannot always do when he prepares medicaments for injection in the usual extemporaneous way. It

not infrequently happens that when a physician finds it necessary to make a subcutaneous or intravenous injection, he does not have the necessary materials at hand. He must wait for water to boil and cool. He realizes that the mass of the tablet that he is to dissolve in his sterile water contains, in addition to the active principles he wishes to use, materials which are unnecessary, and possibly undesirable. Sterile solutions, hermetically sealed in glass, overcome all of these handicaps and meet all the requirements.

The medicaments to be employed require careful investigation and are not easily prepared extemporaneously. An essential element of successful intravenous medication is the special preparation of the remedies themselves.

Solutions of all of the injectable drugs should be made from absolutely pure products in vehicles of which the composition should also be the object of great care. The solutions, containing accurate doses, are put into small glass bulbs, or ampoules, which are then hermetically sealed by heat and subjected to careful sterilization, the method of sterilization being adjusted to the particular product, so that substances liable to be decomposed by heat are not injured. Such solutions, after being sealed in glass bulbs, are kept under observation for a certain length of time, at the expiration of which they are carefully tested chemically and physiologically to ascertain their activity and stability.

Each bulb, or ampoule, has a capacity of 1 Cc., which usually represents a single dose.

Sterile solutions of various drugs for intravenous medication, possessing in a high degree the necessary qualifications for intravenous injection, are readily obtainable in Europe, and American manufacturers seem to be rapidly following in the footsteps of their foreign competitors. Many drugs are injured in attempts to sterilize them by boiling, some are decomposed and made worse than useless. Correct sterilization then is not so easy as it appears, but must be adapted to the physiochemical properties of each preparation. In high-class laboratories this is well understood, and each preparation is prepared in accordance with its individual needs. It is now possible to obtain solutions ready for use, in small glass ampoules, hermetically sealed by heat. These ampoules are put up in suitable packages for convenience and safety (see illustration No. 7), and many physicians make the practice of carrying an assortment of these ampoules in a special case or in their bag.

Where physicians must make up solutions more or less extemporaneously they are always handicapped by the water available. Of course, it may be sterilized by boiling, but it may be too "hard" or contain iron or free alkali. If not correct in chemical reaction it may so seriously derange the delicately adjusted chemical formulæ of the medicaments as to make them unfit for the purpose intended. The only water proper for solutions for intravenous use is sterile *distilled* water. For diluting to a larger volume, as is sometimes desirable, use only sterile distilled water, plain, or containing salts to make it isotonic to the blood serum. The term "physiological salt solution," as ordinarily used, means common table salt in the strength of 0.7 per cent, or 90 grains to the quart, in ordinary boiled tap water, which cannot be filtered owing to the environment. It is well understood that boiling sterilizes the water, but it will still contain the dead bacteria or fungi which were primarily in the water, and these particles of proteid matter in many instances may prove highly undesirable. The proper method is to use distilled water, which has been repeatedly sterilized by boiling and which contains: Calcium chloride 0.25 gm., potassium chloride 0.10 gm., sodium chloride 9.0 gm., to one liter.

This combination of chemically pure sterilized salts, in the amount of water given, forms as nearly as possible a solution which is isotonic with the blood serum. The researches of Ringer, of London, and later Loeb, Howell, and Locke, of Boston, have shown that this combination produces a solution which is practically isotonic with

blood serum and has no injurious effect upon the red blood-corpuscles; it should, therefore, be preferred to improvised solutions. Wherever a physician is operating in a hospital such solutions should be at hand. Where, however, the injections are to be made in the patient's home it may not always be possible to have this isotonic solution ready, although a small amount may be carried in a rubber-stoppered bottle, as would be the case if the physician was making intravenous injections in a routine way. Failing the isotonic solution, ordinary tap water, boiled and cooled after the salt has been added, may be employed without very much danger, as the author believes that the complications described in text-books, while theoretically tenable, are much exaggerated.

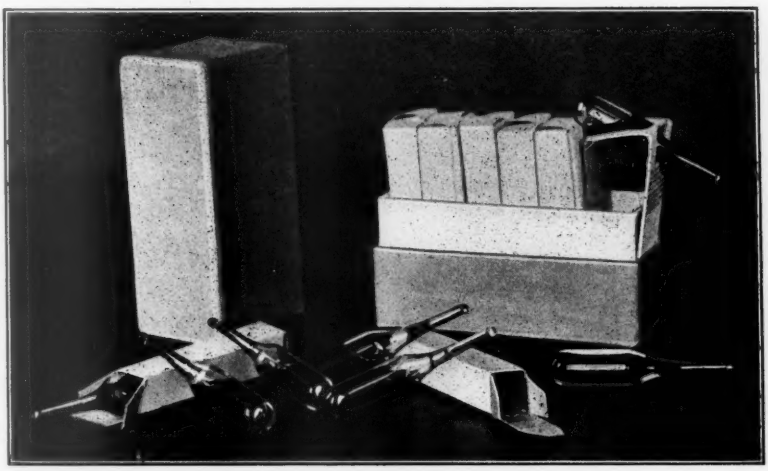
A search of the literature will reveal the fact that a very large and diversified list of drugs have been successfully administered intravenously, some of which will cause surprise owing to their chemical nature. Space permits mention of only a few of the more important drugs in such a list, as the following:

The intravenous injection of mercurialized serum, either autogenous (human serum) or horse serum, containing very small amounts of mercury bichloride, have been employed for the treatment of systemic syphilis. (See *Journal A. M. A.*, December 19, 1914, page 2182, and May 1, 1915, page 1471.)

Pituitary extract has been employed in small doses, injected intravenously, to increase the blood-pressure in toxic blood-pressure depression following infectious diseases, or operations, or great loss of blood.

Quinine dihydrochloride has been employed by intravenous injection in severe types of malaria and in other conditions where a rapid quinine action was desired.

Sodium salicylate has been given intravenously in acute rheumatic fever with cardiac complications in cases of gastric intolerance to the salicylate.



No. 7.—Sterile solutions in hermetically sealed glass ampoules.

Among others I mention adrenalin (1), colloidal mercury (2), colloidal silver (3), colloidal selenium (4), salvarsan (5), glucose (6), atoxyl (7), ether (8), gold and potassium cyanide (9), sodium bicarbonate (10), silver nitrate (11), quinine hydrochloride (12), anthrax serum (13), sodium fluoride (14), strophanthin (15), cholera serum (16), antidiphtheric serum (17), antityphoid serum (18), chloroform (19), digitalone (20), digalen (21), hirudin (22), antitetanic serum (23), and phylacogen (24-25).

CONCLUSIONS.

In concluding, it is realized that the average American medical man will consider this method a dangerous therapeutic innovation and regard it with suspicion. I am very sure, however, by reason of close observation and considerable experience, that this form of medication deserves the very serious attention of the American medical profession.

The physician who makes use of it will soon learn that the intravenous route is decidedly advantageous to the patient, since the medicament is not subjected to influences that may reduce its potency or interfere with its physiological action. Certainty and directness of action are secured by this method of application.

Intravenous injection should be employed without hesitation when the case is urgent or the tissues edematous, or the circulation is so feeble that absorption is slow.

When a drug suitable for the purpose is injected its physiologic and therapeutic effects are produced in the fullest degree in the shortest time and in the most characteristic form. Just as the subcutaneous administration of solutions in many instances is superior to their administration by mouth, so the intravenous injection is better than the subcutaneous. Some of the advantages of intravenous medication may be stated as follows:

The dose is usually smaller (a fraction, one-half, or even less) than the amount necessary to produce an equivalent effect by the oral route.

The effect is prompt, sometimes immediate, and usually may be accurately estimated.

The patient is spared the disagreeable taste, gastric distress, and psychic effects of drugs given by the mouth, and likewise the local reaction, swelling, induration, and pain incidental to hypodermic injections are not seen after properly made intravenous injections.

REFERENCES TO LITERATURE.

1. Cushny: Text-Book of Pharmacology and Therapeutics, 1915, p. 368.
2. Claisee and Joltrain: *Bull. Soc. Méd. des Hôpitaux de Paris,* March 4, 1908.
3. Delhaye: *Ann. Soc. Méd. d'Anvers,* December, 1911.
4. Blumenthal: *.Jour. Méd. de Bruxelles,* Aug. 8, 1912.
5. Ehrlich and Hata: Die Exper. Chemotherapie de Spirillosen, Berlin, 1910.
6. Kausch: *Deutsche Med. Wochenschrift,* 1911, p. 8.
7. Mendel: *Therapie der Gegenwart,* 1910, No. 2.
8. Burkhardt: *Münchener Med. Wochen.,* 1910, No. 7.
9. Bruck and Gluck: *Münchener Med. Wochen.,* 1913, No. 2.
10. Labbe-Carrie: *Revue internat. de Méd.,* 911, p. 250.
11. Hume et al.: *Klinische-therapeutische Wochen.,* 1908, No. 33.
12. Lenzmann: *Deutsche Med. Wochen.,* 1908, No. 10.
13. Sobernheim: *Zeitschr. f. infect.-krank. parasit. Krank und Hygiene der Haut,* Vol. 1, p. 442.
14. Casares: *Deutsch. Med. Wochen.,* 1908, p. 2292.
15. Liebermeister: *Therapie der Gegenwart,* 1908, No. 12.
16. Jegunoff: *Wiener Klinische Wochen.,* 1909, p. 844.
17. Cairno: *Lancet,* 1902, p. 1685. Schreiler: *Münchener Med. Wochen.,* 1909, p. 1597.
18. Kraus: *Wiener Klin. Wochen.,* 1907, No. 12; 1908, No. 18; 1909, No. 41.
19. Burkhardt: *Münch. Med. Wochen.,* 1909, p. 1678.
20. Mendel: *Therapie der Gegenwart,* 1905.
21. Eychmuller: *Berliner klinische Wochen.,* 1909, No. 37.
22. Engelmann: *Münchener Med. Woch.,* 1909, p. 2203.
23. Baccelli: *Lancet,* Jan. 22, 1916, p. 213.
24. Alden: THERAPEUTIC GAZETTE, Dec., 1913, p. 847.
25. Benoit: *E'Union Médicale du Canada,* May, 1913, p. 249.

279 EDISON AVENUE.

EDITORIAL.

THE PASSING OF OLD POPULAR MIXTURES.

With the advances which have been made in our knowledge of disease and with the improvements which have taken place in pharmacy it is inevitable that, from time to time, compounds or mixtures which have been more or less popular with the profession and the laity will pass out of use. In their passing it would look as if they were going to drag down into undeserved oblivion others which the profession have long regarded as of value, and which we think the profession will adhere to even if they are no longer considered worthy by the Committee of Revision of the Pharmacopœia. In the new Pharmacopœia, which is now the authority, such old-fashioned compounds as Hoffman's Anodyne and the vegetable cathartic pill have failed of recognition. If Hoffman's Anodyne has been excluded on the ground that the heavy oil of wine which it contains is a useless ingredient the exclusion is proper, but if it has been excluded upon the basis that the compound is useless we do not think that the conclusion arrived at is correct. For a number of years we have used spirit of ether in place of compound spirit of ether with equally good results without offending the taste of the patient, as is inevitable if a compound containing the heavy oil of wine is employed.

The vegetable cathartic pill, a comparatively new combination, has apparently not been used sufficiently to justify its continuance, and, on the basis that all compounds that have not an extraordinary value should be excluded. it may well be dropped; nevertheless we think that this exclusion will encourage, rather than discourage, the employment of compound pills made by manufacturers, who, for that matter, will probably continue to make the vegetable cathartic pill even if it is no longer official.

In a recent issue of the *Journal of the American Medical Association* the editor expressed the opinion that aromatic spirit of ammonia was an old-fashioned, complex mixture, and that its reputation has little scientific basis. He thinks that whatever effect it has is probably psychic. and that such effect might be expected from the irritation of the nasal mucosa. This strikes us as being a curious form of psychic impression. It is quite true that in the dose of ½ drachm given to an adult its powers are probably not very great, but it seems to us that here we have an illustration of a statement based rather upon opinion than upon experience. Literally hundreds of thousands of persons in and out of the profession are certainly willing to testify that in the dose of a drachm, properly diluted, aromatic spirit of ammonia is a valuable agent for the relief of faintness and even certain types of fatigue, and we believe that those unfortunate individuals who suffer from heart pang of various degrees consider that aromatic spirit of ammonia is a sovereign remedy for the complete or partial relief of the distressing symptoms which they sometimes experience. If those who think that aromatic spirit of ammonia exercises only a psychic effect will take a dose of it diluted with one to two tablespoonfuls of water, we think that they will conclude that they have taken something which acts on other parts of the body than the mind.

A NOVEL METHOD OF USING ADRENALIN IN RESUSCITATION.

Ever since the physiological action of adrenalin was thoroughly comprehended it has been the custom with some medical men to employ it as a vascular stimulant in conditions of threatened or present collapse because of its powerful influence upon the muscular fibers of the blood-vessels. The readers of the GAZETTE will recall that not long ago we published an abstract of a report in which a physician having delivered a child by the Cæsarian operation from a dead mother failed to resuscitate it until the

idea occurred to him to inject adrenalin into the umbilical stump, when prompt resuscitation occurred. The difficulty with the hypodermic injecton of adrenalin is that it is so slow of absorption, and the question also arises as to whether a considerable portion of it is not altered in the subcutaneous tissues, so that by the time it enters the blood-vessels its phyiological effects are materially altered or impaired. When we come to its intravenous injection it is usually found in the patients who need it most that the vascular system is in such a condition that it is difficult to readily find and puncture a blood-vessel, the peripheral circulation having practically ceased.

Our readers will also recall that not long since we published in these pages reports of experiments made for the resuscitation of those apparently dead by the injection into the pericardial sac, through the chest wall, of various medicinal substances which possess the power of stimulating the heart muscle, and while we do not know of any instance in which this has been done in human beings, nevertheless some favorable results have been obtained in animals.

The latest contribution to the possible use of adrenalin in the presence of circulatory emergency is made to the *Journal of Experimental Medicine* of June 1, 1916, by Auer and Gates. They point out that the respiratory route for the administration of active drugs has been very largely ignored, although syphilis is sometimes treated by inhalations of sublimed mercury, and various diseases of the respiratory tract by the use of creosote and other substances in vaporized form, but the respiratory apparatus is practically never used when stimulants for the general system are required, unless we consider the inhalation of ammonia as a form of such medication, and in this instance a considerable degree of its effect is probably the result of reflex irritation rather than absorption.

To express the matter briefly, Auer and Gates found that the injection of adrenalin into the trachea results in its diffusion into the pulmonary alveoli with great rapidity and its corresponding rapid absorption. They made careful studies of the blood-pressure and other vital functions, and found that the adrenalin rapidly produced a physiological effect. The quantity which they employed varied from 0.15 to 0.03 Cc. per kilogram of body weight. Sometimes the injection was made by means of a filiform catheter introduced into the bronchus; in other instances it was directly sent into the lung tissue through the wall of the chest; and, in still other instances, directly through the walls of the trachea by means of a hypodermic needle. Although they are not prepared to present any results obtained by such intratracheal injections of adrenalin in human beings, they nevertheless conclude that such injections can be made repeatedly without harm, that prompt results in the circulatory system ensue, and that tracheotomy is not necessary, since the puncture of the trachea does not seem to be followed with evil results, particularly if the needle is attached to a piece of rubber tubing so that any sudden movement might not break off the needle as it probably would if attached directly to the syringe. We presume that the strength of the adrenalin employed is that which is now universally found on the market, namely, 1:1000. Auer and Gates are prepared, as a result of their investigations, to recommend that this plan be tried in urgent cases.

INTESTINAL PARALYSIS AND ITS TREATMENT BY PITUITRIN.

Under this title an article is contributed to the *Buffalo Medical Journal* for July, 1916, by Colton, who is physician to several of the hospitals in Buffalo, N. Y. After pointing out that intestinal paralysis is apt to be met with after a number of inflammatory and operative conditions, and drawing attention to the fact that in a certain proportion of these cases intestinal movement has become impossible because of anatomical and pathological lesions, producing mechanical difficulties, which can only be overcome by operation, he proceeds to dis-

cuss postoperative paralysis of intestinal movement and also the paralysis and distention which is met with in acute diseases like pneumonia and typhoid fever, detailing cases in which he has given pituitrin hypodermically with excellent results. He details a case with lobar pneumonia with considerable abdominal distention, a rise in pulse-rate, labored breathing, with no relief following the action of cathartics and the use of enemata. The blood-pressure rapidly dropped and the patient failed to respond to camphorated oil and strychnine given hypodermically.

Because of the very great fall in blood-pressure ½ Cc. of pituitrin was injected very slowly into the median cephalic vein. Within thirty seconds Colton states that there was the most remarkable effect he has ever witnessed from any drug, namely, expulsion of large quantities of gas and an enormous stool, the abdomen, in less than three minutes, returning to its normal size. With this a marked improvement in the action of the heart and disappearance of cyanosis took place, followed by rapid convalescence. He quotes a number of authors who have employed pituitrin for the relief of intestinal distention with success. If the pituitrin is given intramuscularly good results are said by Bidwell to ensue in about an hour, but Colton thinks that the intravenous injection produces such immediate results that this plan is preferable.

As illustrative of the value of controlling our evil results, or failures, by exploration or autopsy findings, he cites a case of cholecystectomy in which the patient did well up to the third day, when a rapid pulse and abdominal distention with no movement of the bowels ensued. The patient received 1 Cc. of pituitrin intravenously without any effect, the pulse became more rapid, and the distention greater. This forced the surgeon to a second operation, when there was found 42 inches of gangrenous gut due to embolism of the mesenteric artery. Of course, no drug however active can be expected to produce a movement in the presence of such a lesion as this.

DIARRHEA AND VOMITING IN CHILDREN.

An exhaustive research upon this subject has been contributed to the June issue of the *Quarterly Journal of Medicine* of Oxford, England, by Mellanby. It covers more than two hundred pages and involves a large amount of research in physiological chemistry in connection with matters of feeding and the elimination of various products of metabolism. We have not space in the pages of the GAZETTE to deal with the various points covered in the investigation quoted, so far as experimental methods and results are concerned. With the practical bearing of this study, however, we wish to deal.

The author starts out, as the result of experiments upon animals, by pointing out that a child suffering from an attack of acute diarrhea and vomiting has no food or water in its alimentary canal, has a deficiency of body fluids, to a greater or less degree suffers from loss of bile salts, and soon has no reserve of absorbed foodstuffs. The result of this is to permit of the absorption of toxic substances from the alimentary canal at a maximum rate; and, again, these conditions permit the absorbed toxic substances to have their maximum effect. If the weather is hot and humid the patient suffers from the depressing effects of these atmospheric conditions in addition.

Mellanby clearly recognizes that there are elements of fallacy in directing treatment in human beings from experiments made upon the lower animals, nevertheless it is quite possible that such investigations may throw light upon what is best for children. His belief is that the first and most important thing in the way of treatment is to bring the quantity of body fluids up to and beyond the normal amount, and that this should be done by rectal injection, if it can be retained, by hypodermic injection, and, in grave cases, by intravenous injection, if a vessel can be uncovered. If vomiting is not urgent as much fluid should be given by the mouth in small quantities as the

stomach will tolerate and absorb. He thinks that a small child can take as much as two ounces of water every hour with advantage, and advises for hypodermoclysis that the salt solution should be put in a thermos glass, since by this means its temperature can be kept constant.

In regard to the injection of salt solution intravenously, it is to be remembered that the presence of any pulmonary complication to a large degree contraindicates such procedure, as it may lead to pulmonary edema.

Concerning the use of castor oil, Mellanby quotes Still as recommending it in five-minim doses, because it is his belief that, in this amount, it has a constipating effect.

Concerning the use of opiates, Mellanby is distinctly opposed to them, since he believes that they tend to depress the respiratory center, and, although they may by their suppressing action check the diarrhea and vomiting, the general physical depression which they induce is disadvantageous.

He is opposed to giving children albumen-water in severe diarrhea, as he believes that, in consequence of the decomposition changes in the albumen which are liable to occur in the absence of digestive ferments and hydrochloric acid, toxic substances may be formed. And, speaking theoretically, he raises the question as to whether a 10-per-cent solution of dextrose made up with 0.5-per-cent hydrochloric acid is not the best form of food to administer. Personally, we would prefer giving whey, to which an extra amount of sugar of milk is to be added to increase its nutritive value.

ON THE VALUE OF ADRENALIN IN POLIOMYELITIS.

In the presence of a disease presenting such extraordinary difficulties in its etiology, in its diagnosis, and in its treatment as does acute poliomyelitis, the profession naturally grasps at any method which seems to give promise of saving life or arresting the progress of lesions, which in some cases, because of the deformities which result, may produce a condition which, possibly, is worse than death itself. Opinions based upon statistical reports are often sadly erroneous. The fallacy of statistics is generally recognized, and when the statistical method is applied to the treatment of disease, it is not only open to its ordinary fallacies, but, in addition, it is subject to the errors of diagnosis, to the degree of vital resistance in each individual patient, to the virulence of the infection in each case, to the part of the nervous system which is chiefly involved by the disease, and, last of all, to the length of time which the disease has existed before the method of treatment is instituted.

Up to the present moment only two methods of treatment seem to have given sufficient promise to have encouraged those of experience to pursue them still further. One of these is the injection, subcutaneous or intraspinal, of so-called immune serum derived from the blood of individuals who, at some time in the near or remote past, have suffered from this disease. So far as we know, there is little or no experimental evidence to prove that this serum contains immune bodies. Its employment is based upon analogy with other infectious diseases which produce immune bodies in the blood and with the hope that it will do good, or at least not do harm. In the hands of some practitioners its use seems to have been followed by excellent results, while, in the hands of others, it has notably failed. This plan has also been vigorously attacked by those who believe not only that it is capable of doing harm, but that it is incapable of doing good. Nevertheless, as we have already intimated, the results achieved are encouraging many men to continue its use.

Something of the same sort may be said in regard to the suggestion, first advanced by Meltzer, that intraspinal injections of adrenalin be employed, but a paper, which is of considerable interest in this connection, is published by Lewis in the *New York Medical Record* of September 23, 1916. He points out that the mortality in the city of New York has been 23.9 per

cent, whereas in 77 cases of acute poliomyelitis treated by this method 59 survived. This, to be sure, does not indicate much value in the treatment so far as the avoidance of mortality is concerned, but the treatment does seem to modify the severity of after-symptoms in those that survive. In the 59 cases which received the adrenalin treatment, and of which there is a record six to ten weeks after the onset of the disease, we find that there was complete recovery in 21, or 35.57 per cent; great improvement, with all indications that complete recovery will soon follow, in 21, or 35.57 per cent; probable permanent disability in one or more groups of muscles in 17 cases, or 28.79 per cent. These statistics are, perhaps, the more notable when we find that four of the twenty-one cases that reached complete recovery came under observation when in an extremely moribund condition, little or no hope being entertained as to their surviving. Even if it is urged that the adrenalin did them no good, it certainly did them no harm.

The method employed consists in injecting 2 Cc. of commercial adrenalin solution 1:1000 intraspinally. The injections are given every six hours, day and night, until the temperature remains normal for forty-eight hours. In order to get rid of the 0.5 per cent of chloretone, which is placed in the adrenalin solution for preservative purposes, the bottle of adrenalin, with the cork removed, is placed in a water-bath at boiling temperature for two or three minutes, and then the chloretone-free solution, undiluted, is injected. In those cases in which there was respiratory involvement it is recommended that the injections be given with the patient in the lateral prone position, for putting him face downward embarrasses the respiration and increases the cyanosis. No local anesthetic is employed. The point of election for injection is between the fourth and fifth lumbar vertebræ. Care is to be exercised that the needle does not go through the same skin puncture the second time lest infection be carried into the cerebrospinal fluid. When on the introduction of the needle the intraspinal pressure is found to be distinctly above normal it is relieved by allowing the fluid to escape before the adrenalin is injected. The fluid removed from Lewis's cases was mostly clear, and, in a few cases, opalescent. In one case it was hemorrhagic, but in this instance there was an associated meningitis caused by the Friedlander bacillus.

This method of using adrenalin has been criticized as has the method of using immune serum; nevertheless, up to the present time, as we have already stated, these two methods have been employed more widely and have given better results than any others which have been reported.

THE COMPENSATION LAWS.

There has been much speculation concerning the effect of the compensation laws as administered in the various States, not only on the workmen, the employer, and the doctor, but upon medical education and upon the standard of efficiency to which the physician and surgeon should be held.

The Pennsylvania law became operative on the first day of the present year, and applies to all men who labor and occupy the relationship of employee to employer or servant to master, with the exception of the agricultural worker, the household servant, the casual employee not engaged in the regular course of the business of the employer, and the home worker. Agitation which brought about this legislation, in its varied forms nation-wide, was on the part of organized labor, as suggested by the omission of household servants and agricultural workers. But to the credit of the employer it can be stated that the responsibility placed upon him was accepted without violent struggle and in many cases with cheerful alacrity. This suggests a growing knowledge of the fact that the health, welfare, and happiness of the employee constitutes the greatest asset of the employer.

Concerning the relation of this act to the medical profession, a patient coming under this act must be suffering from an injury by which is meant violence to the physical

structure of the body and such disease or infection as undoubtedly results therefrom. The law does not cover occupational diseases or any illness incident to the performance of labor other than what can be directly traced to the original injury received in the course of employment or because of the condition of the employers' premises. Concerning the compensation of the physician the law is thus written:

"During the first fourteen days after disability begins, the employer shall furnish reasonable surgical, medical and hospital services, medicines and supplies, as and when needed, unless the employee refuses to allow them to be furnished by the employer. The cost of such services, medicines, and supplies shall not exceed twenty-five dollars, unless a major surgical operation shall be necessary, in which case the cost shall not exceed seventy-five dollars. If the employer shall, upon application to him, refuse to furnish such services, medicines, and supplies, the employee may procure the same, and shall receive from the employer the reasonable cost thereof within the above limitations. If the employee shall refuse reasonable surgical, medical, and hospital services, medicines and supplies, tendered to him by his employer, he shall forfeit all right to compensation for any injury or any increase in his incapacity shown to have resulted from such refusal."

Further come the following regulations: "Any time after an injury the employee, if so requested by his employer, must submit himself for an examination, at some reasonable time and place, to a physician or physicians legally authorized to practice under the laws of such place, who shall be selected and paid by the employer. If the employee shall refuse, upon the request of the employer, to submit to the examination by the physician or physicians selected by the employer, the Board may, upon petition of the employer, order the employee to submit to an examination at a time and place set by it, and by the physician or physicians selected and paid by the employer; or by a physician or physicians designated by it and paid by the employer; and if the employee shall, without reasonable cause or excuse, disobey or disregard such order, he shall be deprived of his right to compensation under this article. The Board may at any time after such first examination, upon petition of the employer, order the employee to submit himself to such further examinations as it shall deem reasonable and necessary, at such times and places and by such physicians as it may designate; and, in such case, the employer shall pay the fees and expenses of the examining physician or physicians, and the reasonable traveling expenses and loss of wages incurred by the employee in order to submit himself to such examination. The refusal or neglect, without reasonable cause or excuse, of the employee to submit to such examination ordered by the Board, either before or after an agreement or award, shall deprive him of the right to compensation, under this article, during the continuance of such refusal or neglect, and the period of such neglect or refusal shall be deducted from the period during which compensation would otherwise be payable.

"The employee shall be entitled to have a physician or physicians of his own selection, to be paid by him, participate in any examination requested by his employer or ordered by the Board."

It is apparent in the first place that the working of this law insures prompt treatment for all injuries. It is to be hoped that it will be extended in its scope so that it will apply to at least occupational diseases. This immediate attention implies the prevention of infection and other sequelæ which in the past have so often been the cause of permanent crippling or even death. It is also obvious that the employer, usually a man of intelligence and of business acumen, will hold the medical profession to a far stricter accountability for neglect or incompetence which cost him money than did the subject of such neglect or incompetence in the past or any one representing him.

It also seems clear that industrial surgery and medicine must receive a more intensive study than are accorded to them, and that the successful schools will be compelled to

rapidly assimilate and impart to the future practitioners the knowledge gained by such intensive studies. Hence the effect of compensation laws, whilst beneficial to the workmen and salutary to the employer, is both directly and indirectly helpful to the medical profession and its practitioners.

Mackey (*Pennsylvania Medical Journal*, July, 1916) states that the Pennsylvania Board has approved 7500 voluntary agreements entered into by employer and employee fixing compensation, and that of the 88,220 industrial accidents which have happened in Pennsylvania since January 1, only 18,660 have compensation features, while every one of the 88,220 required medical attention at the expense of the employer. It is obvious that the employer's first act on the passing of the compensation law would be the procuring of insurance. Mackey, questioning all the great carriers licensed to write this insurance, found that fully 50 per cent of all the money paid by these carriers on account of the Workmen's Compensation law goes to physicians. Thus the doctors have been directly financially benefited by the law, their opportunities for professional engagements have been increased, and they have secured prompt payment of their fees. It should be remembered that the purpose of the law is to assist industrial workers, and even if this involves some sacrifice the medical profession should be willing and very glad to do their part to secure the great benefits which must accrue to the army of wage workers.

In the majority of States it is compulsory upon the employee to accept the physician whom the employer chooses to send. In Massachusetts, for instance, if an employee desires a doctor or a hospital other than that provided by his employer he must pay. Actually the Industrial Accident Board has worked out a middle course which, under reasonable regulations, permits free choice.

In Pennsylvania from January 1 to May 10, 1916, there were more than 800 working men and women who lost their lives in the course of their employment.

Van Sickle states that the Workman's Compensation laws are here to stay. "They are of immense benefit to the industrial community when properly drawn and properly applied. To the medical profession, from the point of affecting the physicians' recompense, they have the advantage of certainty of payment, a fair degree of continued service throughout the year, offering an opportunity to take industrial accident work and at the same time carry on the usual every-day practice, especially in smaller communities where not under specific contract by corporations. This method of compensation under industrial laws tends to offer the opportunity to specialize and become more proficient on the part of those desiring to undertake this class of work.

"A better understanding of the law in each individual State, under which the physicians and surgeons are working, will have a tendency to make possible a better compliance with the law, and, as a result, establish harmonious work between the commission or board applying the law and the physicians of that State. Wherever unity among the physicians of the State is established, legislative coöperation must and will be brought about."

REPORTS ON THERAPEUTIC PROGRESS.

AN INVESTIGATION OF THE BEST METHODS OF DESTROYING LICE AND OTHER BODY VERMIN.

KINLOCH in the *British Medical Journal* of June 3, 1916, reaches these conclusions:

1. As Bacot has shown, and as the writer's later experiments also demonstrate, lice do not survive immersion in boiling water.

2. Several insecticidal powders have been tested, and of these naphthalene, creosote and iodoform powder is the most destructive to lice.

3. Of the three constituents of N. C. I. powder, naphthalene and creosote have each a strong insecticidal action. The insecticidal action of iodoform is feeble.

4. Naphthalene appears, so far as Kinloch's comparative tests have gone, to be the most suitable basis for use in the preparation of a powder destructive to lice. Commercial naphthalene is more actively insecticidal than pure naphthalene, and it appears that the lethal power of naphthalene for lice is dependent in great part on the presence of hydrocarbons and coal-tar derivatives other than pure naphthalene.

5. The immediate lethal effect of creosote when mixed with naphthalene is less than that of some other insecticidal liquids, but the longer period during which creosote continues to act more than compensates for the initial disadvantage.

6. In addition to its feeble insecticidal activity, iodoform greatly increases the adhesiveness of N. C. I. powder for cloth. The inclusion of iodoform in the powder is accordingly justified, although similar adhesiveness of the powder is obtainable at less cost by substituting the insecticidally inert but cheaper magnesium silicate for iodoform in the powder.

7. The insecticidal power of naphthalene-creosote powders gradually diminishes when they are exposed in the open air.

8. The moist nature of such powders precludes their being used successfully in perforated tins, and it has not been possible to dry the powders and at the same time retain the moist and volatile hydrocarbons and other coal-tar derivatives on which the insecticidal effect mainly depends.

GANGRENE OF THE LUNG FOLLOWING ARTIFICIAL PNEUMOTHORAX.

In the *American Journal of the Medical Sciences* for June, 1916, PACKARD writes on this topic and reports a death from this treatment. He thinks the following sequence of events may have occurred:

1. To begin with there was a rapidly disintegrating lung with superficial cavities.

2. More or less extensive necrosis of lung tissue due to obliterative endarteritis.

3. The introduction of gas collapsed the lung, limiting the blood supply, and thus aiding in the extension of the necrosis.

4. Putrefaction now took place and gangrene supervened upon the necrotic area.

5. Rupture of the lung then followed and the pleural fluid became putrid and corroding.

Putrefactive organisms and large necrotic areas are frequently present in tuberculous lungs and do not produce gangrene. There is no reason to suppose that had this lung been left alone it would have become gangrenous. It would appear that the collapsing of the lung was the immediate exciter of the subsequent events.

Other lungs in a similar condition have been collapsed without bad results, but evidently such a procedure is fraught with danger.

INTRASPINAL INJECTIONS OF BICHLORIDE OF MERCURY.

In the *Boston Medical and Surgical Journal* of June 1, 1916, HUNT states that at a recent meeting of the section on medicine of the New York Academy of Medicine he reported forty cases of spinal syphilis which had been treated by the intraspinous administration of mercurialized serum, and five cases which had been treated by the direct intraspinous injection

of bichloride of mercury. The forty cases he was able to give fairly definite reports on, and recited some conclusions. Since then he has treated twelve additional cases by the direct administration of bichloride of mercury into the spinal fluid.

The method of administration was as follows: Weigh out one gramme of Merck's bichloride of mercury; dissolve this in 770 Cc. of distilled water; sterilize the whole. One cubic centimeter of this solution contains .0013 gramme of bichloride of mercury, which is equal to 1/50 of a grain. Draw off 15 Cc. of spinal fluid; discard 5 Cc., and to the remaining 10 Cc. add 1 Cc. of the bichloride solution previously prepared. Then reinject directly into the spinal canal, very slowly, the whole 11 Cc. The time consumed in performing this reinjection should be about four minutes. To minimize the handling of the solution and so decrease the chances of infection, it is best to draw the 1 Cc. of the bichloride solution directly into the syringe, and mix the two solutions there in the hypodermic. Then reinject the entire 11 Cc. The patient should then be put back to bed, and for the first five or six hours the foot of the bed should be elevated. This precaution is taken in order to diminish the tendency of the patient to acquire a headache.

The twelve treated cases all come under the head of syphilis of the nervous system. They consisted of general paresis, tabes, taboparesis, hemiplegia, optic nerve atrophy, and one case of brain syphilis with complicating hemiplegia. These cases were given either 1/64 or 1/50 of a grain of bichloride of mercury at each intraspinous injection. The usual plan was to give 1/64 at the first dose, and then 1/50 at subsequent doses. In a few cases, however, the maximum dose of 1/50 was given at the beginning. The injections were approximately at intervals of two weeks; in a few instances it was not possible to give them exactly on the day, but an effort was made to have the dosage as nearly as possible every fifteen days. All of these patients were at the same time being given a mixed antisyphilitic treatment—that is to say, potassium iodide by mouth, and on the alternate weeks hypodermic injections of the salicylate of mercury, of a grain or less.

In a few of these patients it was not possible to obtain definite results, but in the large majority improvement was manifest. The reaction was nearly always present, of varying extent. In some the pains became very severe, lasting two or three days; in others the shooting pains in the legs were moderately increased for a few hours. In a very few of the cases there was persistent after-vomiting. In one there was very marked involvement of the sphincters. This patient lost control of his bladder for three weeks, and of his intestinal tract for two weeks. He is, however, growing stronger, and there is every indication that in time he will control both functions.

The conclusions which Hunt reaches in the twelve cases reported are neither final nor conclusive. He fully realizes that the number of cases is not sufficient, and that the time in which they were followed is not long, nor were a sufficient number of intraspinous injections administered. However, the conclusions drawn were as follows:

1. The spinal fluid Wassermann remained unchanged even after three or four treatments.

2. The globulin did not undergo much, if any, change; occasionally a ++ became a +.

3. The reaction after the treatment was usually not severe, and generally amounted to shooting pains in the legs of marked severity.

4. There was always a possibility of getting a considerable degree of rectal or bladder sphincter disturbance, which was, however, temporary.

5. The cell count was almost always lowered.

6. The shooting pains in the legs were almost invariably relieved.

In other words, the administration of bichloride of mercury directly into the spinal fluid gives practically the same results as the administration of mercurialized serum. It has the advantage over the latter of simpler technique, shorter methods, and easier

administration, with less opportunity of infection. The great advantage, to the writer's mind, lies in the fact that the operation is simpler, and there is less involvement on the part of the laboratory. Both methods, that of the mercurialized serum and that of the bichloride directly injected into the spinal fluid, can be considered as valuable substitutes for the administration of salvarsan. Whether the results will be as permanent as the latter remain to be seen.

It is certainly fair to say that no ill results can accrue from the direct intraspinous injection of 1/50 of a grain of bichloride of mercury in syphilis of the nervous system.

It is well to make the initial dose small; it is therefore better to begin with a dosage of 1/64 of a grain and later increase it to 1/50.

In no instance was any change manifest in the reflexes, but change was evident in tremors, in the pains, in the spinal fluid content, and especially in the general condition of the patient. There is no doubt that any of these injections—salvarsan, mercurialized serum, or bichloride of mercury—have a very good moral effect on these patients, and for that reason alone should be encouraged.

THE EPIFASCIAL METHOD OF INJECTING MERCURY AND SALVARSAN DERIVATIVES.

Wolbarst in the *Medical Record* of June 3, 1916, in writing on this subject states, as regards the epifascial injection of mercury, that it is his belief that this method has a distinct field of usefulness and is a decided improvement over the purely intramuscular method of administration.

First, as regards absorption: It would appear that the solution or suspension (depending on which form of mercury is being used) is absorbed with the same readiness in this method as in the intramuscular injection. If there has been any failure of absorption resulting in encapsulation and infiltration, he has not observed a single evidence of that occurrence. In not a single instance has infiltration or necrosis developed, nor has there been any evidence of localized inflammation at any time.

From the standpoint of pain the matter cannot be dismissed so readily, for the personal equation enters largely into this subject. Some injections have been absolutely painless—about 20 per cent; many have been painful for a day or a part of a day—about 60 per cent; the remainder, about 20 per cent, have suffered more or less severe pain for periods varying from one day to two or three weeks, the pain increasing for about two days and gradually diminishing.

The medium employed for the injection seems to have no bearing on the element of pain in these cases. In some cases mercury salicylate administered epifascially gave no pain whatever; in other cases pain was severe and lasted several days. The soluble preparations reacted to pain in the same uncertain way; one can never tell whether a particular pateint is going to suffer pain or have no pain at all. Nor is there any way of telling where the pain is going to be felt. Most patients feel the pain about two inches below the point of injection, but as the patient assumes the erect position in walking about, the fluid seeks its lowest level and thereby causes the pain at that point, and not at the immediate site of the injection. One of Wolbarst's patients, a rather fleshy woman, never felt the pain in the buttock at all; four or five hours after an epifascial injection, when the effect of the local anesthetic had passed off, she began to feel a more or less severe pain running down the thigh along the course of the sciatic nerve, the pain sometimes extending down to the toes and making it uncomfortable, and even impossible, to wear a tight shoe. Whatever spot was chosen for the injection in this patient, the pain was sure to be felt along the course of the nerve, but never at the immediate site of the injection. In quite a large proportion of cases the pain was felt in the thigh at some point distant from the site of injection, and in most of these the pain apparently ran along the course of the sciatic nerve.

The technique of the epifascial injection

is not difficult once it is mastered. It is peculiarly difficult to describe. It is based on the theory that medication fluid injected in proximity to the layers of the fascia lata will be less painful and cause less inflammation with equal absorption than when deposited in and between the muscle fibers. The success of the technique depends on the surgeon's ability to determine whether the point of his needle is in proximity with the deep fascia or simply in the muscle proper of the buttock. Experience with the method gives an amount of information which cannot be imparted in words. The needle is plunged into the gluteal muscle as in the intramuscular method; it is then manipulated until the hand feels that the needle point is moving freely from side to side, and is not being impeded by muscle fiber. When that sense of free motion of the needle point is felt, the surgeon may be certain that the point is in proximity with the deep fascia. Any doubts on this score may be cleared up easily by the simple expedient of injecting ten to fifteen drops of sterile water, saline solution, or, better still, a local anesthetic solution, and withdrawing the syringe but not the needle. If the eye of the needle is epifascial, there will be a steady flow of the injected fluid, drop by drop, from the needle; if, however, the needle point is in the muscle tissue, there will be no flow of fluid. In that event the needle is manipulated—*i.e.*, pushed in deeper or pulled out further, until such a point is reached where the injected fluid issues steadily from the needle. Wolbarst then proceeds with the injection.

Recalling the anatomy of the buttock with reference to the fascia lata, we find that the fascia lata passes down from its attachment to the iliac crest over the gluteus medias to the upper border of the gluteus maximus, where it splits in two layers, one passing above and the other passing below the fibers of the latter muscle. At its lower border the two layers unite to form one layer again. It is therefore evident that any point on the side of the buttock, the pateint lying flat on the table, face downwards, will bring the injected fluid in contact with the fascia. The needle is plunged in horizontally—that is, at right angles to the side of the buttock. Wolbarst finds a needle about 1¼ to 1½ inches long is most suitable for this purpose.

As previously stated, a local anesthetic fluid may be used to determine whether the point of the needle is epifascial or intramuscular. This serves the double purpose of giving us the information that the needle is properly placed, and also of making the injection proper absolutely painless. Wolbarst has injected neosalvarsan and mercury epifascially without the slightest sensation of discomfort or pain, by the employment in this manner of a local anesthetic, such as 2-per-cent alypin or novocaine. Not more than ten to fifteen drops are needed to anesthetize the site of the injection. This freedom from pain is, of course, but temporary, like all local anesthetic effects, but the step has the double advantage already indicated above.

The epifascial technique requires the employment of a needle and two syringes for its best results, though one is sufficient for practical purposes. The needle having been plunged into the buttock, the first syringe, holding ten to fifteen minims of anesthetic solution, is attached and the fluid deposited epifascially; this syringe is now detached from the needle, which is meanwhile held steadily in place so as to prevent its moving, and the second syringe containing the medication fluid is now attached and the process completed. Wolbarst thinks this method is one that offers a distinct improvement on the intramuscular method and is worthy of further study and attention.

THE THERAPEUTIC POSSIBILITIES OF ANTITETANUS SERUM.

The *American Journal of the Medical Sciences* for June, 1916, contains an article by ROBERTSON in which he reminds us that early in his work on tetanus antitoxin, Behring recognized the theoretical advantages of intravenous injections, but he exhibited a distinct hesitancy toward giving this method his unqualified indorse-

ment. This hesitancy evidently, in part at least, proceeded from a fear of the dangers incident to the injection of a foreign serum into the body and a belief that these dangers were more threatening with intravascular than with subcutaneous administration. It is true that with extensive use of diphtheria antitoxin, cases of "serum Krankheit" became fairly common, and in a small percentage of cases threatening symptoms of asphyxia and even death followed its use. While, however, the occurrence of urticaria and other skin phenomena, following the administration of tetanus antitoxin, is well known, there are, so far as Robertson has been able to find, very few records of "serum death" which really resulted from its use. Not only has the work on anaphylaxis or proteid reactions shown that there is little difference to be observed as regards the method of injecting the foreign proteid, but with the present purification and concentration of modern antitoxic serums this danger has been reduced to a negligible minimum.

On the contrary the subcutaneous method has met with much more favor from the clinical world, and largely because of its simplicity and ease it may be said to-day to be the one most usually employed. It should be distinctly emphasized that for therapeutic or curative purposes—*i.e.*, after symptoms have appeared—this method is a useless and irrational waste of precious time. All local subcutaneous injections of antitoxin are ably fully to protect the local area from toxin. But the main purpose is not to protect the local area, but to reach the toxin circulating in the blood.

Robertson proposes, therefore, that every case in which symptoms of tetanus appear be treated at once, without delay, with an intravenous injection of 3000 units of antitetanus serum. The "at once" should be emphasized. Even the saving of minutes of time may mean the difference between life and death of the patient. The experiments of Donitz and others show with what exceeding rapidity toxin travels in the body and how soon it passes in part beyond the reach of all antitoxin. It is not believed that by this or any other known therapeutic procedure the lives of all or even of any large proportion of tetanus patients can be saved. Prophylaxis is, as has been shown, the only means known at present which can bring the death-rate in tetanus to anywhere near the zero point. It is desired here merely to emphasize that by this method every patient who exhibits the symptoms of tetanus is given the best possible opportunity of preserving his life. Difficult or dangerous surgical operations, such as the intracerebral method or intralumbar injection, need not be considered; the loss of time and local pain of subcutaneous injections are avoided, and, what is of less theoretical but nevertheless often of more practical serious moment, the use of large amounts of serum obviated. The method consists simply in the immediate insertion of 3000 units of antitoxic serum into one of the veins of the elbow.

Furthermore it is of little or no value to repeat this dose twice a day or every other day, or, in the large majority of cases, at all. The one injection of 3000 units is amply sufficient to neutralize the toxin which might be elaborated and absorbed from any ordinary tetanus infection, and this antitoxin will remain effective in the blood stream for at least one week—*i.e.*, long enough to decide the issue in almost all cases of human tetanus. If the case should become chronic or suffer a recurrence, or any other special condition should develop which might indicate the advisability of giving more antitoxin, there can be no objection to a second or even a third dose; but here again it should be emphasized that a small dose is fully as effective as a large one, and a large dose is as unjustifiable the second time as it was the first.

In conclusion, Robertson would like to be certain that undue emphasis shall not be placed upon the element of dosage. The proposal is that as soon as symptoms of tetanus have appeared, 3000 units of antitetanus serum should be injected at once into the circulation. The immediate intra-

vascular injection is the important feature and the amount of the dose a purely secondary matter. Personally, he is fully convinced, for reasons which cannot be discussed here, that one-half this amount would be as efficacious. Twice this dose, however, can do no harm. The main stress is here laid upon the recognition of the theoretical considerations which underlie the therapeutic application of antitetanus serum and a rational modus operandi based upon these principles.

Naturally the complete treatment of the disease involves the application of many other measures the consideration of which does not come within the scope of this paper, but will be fully discussed in a later article.

THE TREATMENT OF HEPATIC FAILURE IN YELLOW FEVER, MALARIA, AND OTHER CONDITIONS: A SUGGESTION.

BALFOUR in the *Lancet* of May 20, 1916, publishes a paper with this title. He asks the question, What are the symptoms associated with the destruction of liver cells? They are chiefly of cerebral origin, pointing to a poisoning of the higher nerve centers. The patient begins to grow restless, watchful, excited, anxious, and light-headed. He complains of severe headache, and, it may be, of photophobia. He wanders in his mind and suffers from an incoherency of ideas and from hallucinations. His muscles twitch and tremble and delirium ensues. It may be of a low, muttering type, or may become active, the patient trying to get out of bed, but it is not usually very violent, for there is great weakness. Convulsions may set in, and if cardiac or respiratory failure does not occur coma ends the scene. In addition, Balfour finds that if jaundice is already present it deepens, while hiccough, clammy sweats, and anuria are not infrequent.

It will be found that these symptoms are common to delayed chloroform poisoning, yellow fever, severe cases of epidemic jaundice, the so-called Mediterranean yellow fever, Weil's disease, whatever that may be, blackwater fever, certain forms of fatal malaria, acute yellow atrophy, phosphorus poisoning, etc.

All this is well known, but confining himself to the tropical diseases, it would seem that these symptoms have been vaguely attributed to the action of the toxins of the virus causing the disease and that little or no attempt has been made to treat the serious liver condition which is present. It is true that in yellow fever a lessening of the urea function of the hepatic cells and resulting ammoniemia with its toxic cerebral effects has been recognized, and we are advised to dilute the toxins in the blood and to stimulate the action of the kidneys by an alkaline treatment such as that of Sternberg. This treatment has the further benefit of counteracting the blood acidosis which is present in these cases, and which may be recognized by the occurrence of acetonuria. It is noteworthy that Burkitt has quite recently treated with success cases of blackwater fever by means of intravenous injections of calcium chloride and either potassium or sodium bicarbonate. By this means he combats the diminished blood alkalinity, for the urine in blackwater cases contains acetone. The acidosis, of which it is the expression, is due to the fatty acids being poured into the blood owing to the disordered hepatic condition, and the above line of treatment is undoubtedly based on sound principles. The object of this note, however, is to suggest that we may go further and, on the lines indicated by Colonel Hunter in cases of toxemic jaundice, etc., endeavor to prevent or at least cut short the rapid destruction of liver cells which, it seems to Balfour, plays so important a part in bringing about a fatal issue in such diseases as yellow fever and bilious remittent fever.

It is necessary briefly to consider how this destruction is brought about. Colonel Hunter's views are fully set forth in Allbutt's "System of Medicine," vol. iv, part 1. He believes that in such diseases the antitoxic functions which the liver cells discharge in relation to the portal blood are first of all depressed and then suppressed by the poisons generated by the disease

viruses. Strain is thrown on the liver cell. It endeavors to maintain its energy by taking up carbohydrate material. If sufficient cannot be obtained from sugar it turns to the fat, and when this also fails to yield the supply, to tissue proteins. There is thus increased fat metabolism with acidosis and acetonuria, and the liver cell, coming under the influence of its own ferments, undergoes autolysis and thus presents the characteristic appearances seen post mortem. Colonel Hunter further thinks that ammonia, as a rule, keeps the ferments in check, and that the practice, common alike before operations and in the early stages of febrile diseases, of purging the patient with calomel and of withholding food, prevents the formation of ammonia and thus the hepatic ferments have full play. As already stated, the liver cells being thus thrown out of action fail to deal with the poisonous portal blood. The latter passes unchanged into the general circulation and the characteristic cerebral symptoms result.

Balfour is aware that Colonel Hunter's views have not met with acceptance in all quarters, and that the precise manner in which the disease toxins act on the liver cells has not been ascertained. It may, as has been suggested, be a neutralizing action upon antiferments which, quite apart from any question of ammonia, normally preserve the hepatic cells from self-digestion. All these questions require further elucidation, but Colonel Hunter's theory and researches have certainly led to one important practical conclusion—*i.e.*, the necessity in cases of delayed chloroform poisoning and toxemic jaundice of keeping up the supply both of sugar and protein food, the latter in peptonized form. The former is insured by the administration of glucose. It can be given by the mouth or as rectal enemata, solutions of 5 or 10 per cent being used. If pure glucose cannot be obtained, preserved (candied) fruits may be given, or, indeed, sugar in any form. The necessity for protein is met by administering enemata of peptonized beef-tea, eggs, or other protein material.

So far as Balfour knows, this line of treatment has not been tried in those tropical diseases in which hemohepatogenous jaundice is a marked and important feature, and it is with the object of directing attention to the advisability of employing it that he submits these few notes. They make no claim to any originality, but merely voice a suggestion which he trusts may prove useful, for the treatment of yellow fever and other tropical diseases in which liver failure occurs is at present far from satisfactory.

COMMON COLDS.

SMART in the *Virginia Medical Semi-Monthly* of May 26, 1916, states that the routine that he follows in cases in which he has reason to fear sinus trouble is, in addition to the constitutional treatment, to prescribe a powder containing 1 grain of menthol, 2 grains of bicarbonate of soda, 3 grains of light magnesium carbonate, 4 grains of cocaine hydrochloride, and a drachm and a half of milk-sugar. A little of this is to be snuffed up each nostril often enough to keep it open and clear, but in no case oftener than every two hours. There is little danger of contracting a fondness for the cocaine as most of it is washed out in the secretions. He has prescribed it a number of times and has never known of a patient using more than a half bottle in the course of one cold (except in hay-fever), so that they get only about two grains of cocaine in the whole treatment.

Smart also has them irrigate the nose with a teaspoonful each of salt and soda in a quart of warm water two or three times a day, using a fountain syringe placed not over two feet above the head. This is a safe and fairly satisfactory pressure. [Some rhinologists disapprove of this.—ED.]

Another thing Smart has found valuable for increasing the comfort of the patient as well as lessening the secretions, is the administration of tablets containing atropine and camphor, the so-called rhinitis or coryza tablets. Personally, he prefers the formula of Dr. S. MacCuen Smith, which

contains 1/600 of a grain of atropine and ¼ of a grain of camphor, besides several other ingredients of less importance. He has them take two every three hours until the patient notices an uncomfortable dryness in the throat or a palpitation of the heart.

Another thing that we are not careful enough about is instructing our patients how to blow the nose and how not to blow it. Of course we all know the dangers of trying to blow while holding both nostrils tight, but the average patient does not realize them, and he seems to take pride in the volume of sound produced, blissfully ignorant of the risk he is running of infecting his ears.

To summarize:

Every case of cold is a potential case of serious sinus or ear trouble.

Early recognition and treatment of these complications is of the utmost importance.

As the onset of these complications is often very insidious, it is highly improbable that a patient left to his own devices will recognize the presence of any serious trouble until the time has passed when the disease would be most amenable to appropriate treatment.

Therefore, the physician, even though he may not deem it necessary to treat the primary cold, is not fulfilling his whole duty if he fails to keep him under observation until the cold is a thing of the past.

NITROUS OXIDE ANALGESIA IN OBSTETRICS.

HEANEY states in the *Medical Record* of June 3, 1916, that with a proper machine nitrous oxide may be so given that a patient is oblivious to pain yet maintains consciousness and coördination. The quantity of gas necessary to produce this state varies with the individual; some require much, others quickly pass from the equilibrium of analgesia into anesthesia. In order to produce a more stable equilibrium, oxygen is mixed with the gas so that the concentration of the nitrous oxide may be varied to suit the individual as well as the changing character of her pains. The more susceptible the individual, the more apt she is to become cyanotic and unconscious, the greater the percentage of oxygen necessary in the mixture.

A few pains will show what mixture is best for a given case. When the mixture is right, two to three quick inhalations at the beginning of a contraction are sufficient to prevent the contraction being felt, and the patient's normal color and consciousness are preserved; she can bear down when directed and can follow every command of the attending physician. If the mixture is too rich, the patient becomes cyanotic or anesthetized and has confusing dreams. No physical harm results from slight excursions into anesthesia, except that if the expulsive stage is on the patient cannot give the very necessary help which is so characteristic of the proper stage of analgesia. When giving gas for the first time, the tendency is to give more than necessary; with familiarity, much less gas is used.

The administration may be begun at any time. Usually this is left to the inclination of the patient. As soon as she feels inconvenienced by the strength of her pains she makes the fact known, and the analgesia is started. It is rarely asked for before the first stage is well advanced; oftentimes not until dilatation is complete. The A. C. Clark Company has placed a trigger valve next to the inhaler, and since their gas machine is equipped with automatic regulators controlling the gas pressure, the patient may administer her own analgesia during the early stages of labor, the indicators being set for a constant mixture of gas and oxygen. In the event that she should pass beyond the analgesic zone the hand relaxes and the valve closes. With the approach of her next pain she applies the inhaler, presses down the valve, inhales, and the gas flow is started again. As labor advances it is necessary that the physician be in attendance.

Normally the uterus begins to contract several seconds before the patient perceives pain. If, when the attendant palpates the approaching uterine contraction, he places the inhaler in position and directs the pa-

tient to take the necessary number of inhalations determined as necessary in her case, she is well within the analgesic zone by the time the contraction would ordinarily be producing pain. If the labor is in the second stage, the patient is then directed to hold her breath and to bear down, and to pull upon the straps provided for the purpose. After the maximum effort is expended, she is directed to take another deep breath or two and to again bear down. The usual second-degree pain is such that it is divided into three or four expulsive efforts. The first inhalations are usually pure nitrous oxide, while each subsequent inhalation is of a more diluted mixture, the degree of dilution varying in each case and at different periods during the same labor. When the uterus is felt in beginning relaxation, the mask is removed, and the hand is placed upon the abdomen to anticipate the next pain. If the administration of the gas is delayed each time until the patient herself feels the pain, the result will be decreased pain instead of painless.

High-strung individuals with keen perceptive qualities sometimes suffer pain before the attendant can detect that the uterus is contracting. In such cases occasionally we have to administer a light continuous analgesia, if the patient is in the second stage, or administer a dose of chloral if in the first stage, to decrease the keenness of perception.

Nitrous oxide analgesia does not lessen the frequency or the intensity of uterine contractions, so that if for any reason it is deemed that the birth is advancing too rapidly, ether may be mixed with the gas or substituted for it. When the pains are again satisfactory, the ether is stopped and nitrous oxide resumed. As the head passes over the perineum occasionally the gas must be administered to the anesthetic degree, though usually analgesia is entirely sufficient.

The heart tones of the mother and child are unaltered by nitrous oxide analgesia, so that the criteria to the well-being of the child are uninfluenced by the fact that the mother is receiving nitrous oxide.

The child cries immediately upon birth, since its dose of gas is as evanescent in its action as is the mother's. The mother is in full control of her faculties within a minute or two after delivery, and suffers no inconvenience from her analgesia.

There is no relaxation of the uterus, and, providing ether has not been used, the third stage terminates as promptly and as satisfactorily as when no anesthetic is given. The perineum may be repaired under analgesia or in a deeper stage of anesthesia, as the occasion demands.

THE TREATMENT OF MUSCULAR RHEUMATISM.

In the *New York Medical Journal* of May 27, 1916, CHENEY reminds us that at the present time the most popular and most promising theory in all of these chronic ailments known as muscular rheumatism is that of local infection. This means that somewhere in the body, in every such case, there is a source from which toxins or microörganisms themselves constantly enter the blood and continue to exert an influence upon various parts of the body, particularly upon muscle tissue and joints. This theory, put forward particularly by Billings, calls attention to tonsils, gums, carious roots of teeth, or sinuses about the face; prostate gland or Fallopian tubes; gall-bladder, appendix, or large intestine, as possible sites of infection, which must be sought for and eliminated as a rational first step toward the cure of chronic muscular rheumatism as well as arthritic affections. There can be no doubt about the importance of this factor in etiology, or the value of its discovery and removal in therapeutics. Too many observations have already been made in the matter, by numerous men, to permit of skepticism. The removal of diseased tonsils; the cure of pyorrhea; the discovery, by ordinary exploration or by *x*-ray films, of abscesses at teeth roots, and their eradication; the surgical drainage of infected sinuses; the repeated stripping of prostate glands containing infected secretions; or the removal

of diseased tubes, gall-bladders, or appendices—all have been reported as resulting almost magically in the relief of persistent, painful, and incapacitating affections of muscles. As regards the intestinal tract, disinfection by overcoming stasis, by laxatives, by diet proper in quality and quantity, and particularly by the use of cultures of the Bulgarian bacillus, has likewise in certain cases proved highly effective in the treatment of chronic muscular rheumatism. All these methods are rational because they are based upon a proved etiology, and will probably be more and more the first thought, as time goes by, to the exclusion, or at least to the great diminution, of the older methods.

THE TREATMENT OF TUBERCULOUS ADENITIS BY ROENTGEN RAYS.

Writing in the *New York Medical Journal* of May 27, 1916, Boggs asserts that different authorities call attention to the fact that when medical treatment of tuberculous adenitis alone is adopted, from twenty to twenty-five per cent of the patients ultimately acquire pulmonary tuberculosis. The medical measures can be continued in conjunction with the Roentgen rays. Enlarged glands due to an inflammatory process are frequently secondary to a septic condition elsewhere, and search should be made for the primary lesion. When this is found and treated, if the glands remain large and particularly if they show a tendency to suppurate, the Roentgen rays are indicated. If they are given promptly and properly, suppuration can usually be avoided. Boggs does not favor opening a tuberculous mass as soon as it begins to soften, as many advocate. A few Roentgen exposures given first greatly facilitate repair of the parts, and the sinus which follows will not be so deep and will heal up more rapidly. Certainly nothing is slower in healing than a sinus leading into a gland which has been opened just as suppuration was beginning. It is a well-known fact that we have no better treatment than the Roentgen rays for carbuncles, boils, or any of the localized pus infections. How readily and promptly is pustular acne cured by the Roentgen rays! Then why be in such haste to open a tuberculous gland before it begins to bulge? Under Roentgen treatment they are never painful.

In conclusion, radiotherapy stands in a different place than it did two years ago. The flexibility of the Coolidge tube makes it possible to give treatment more accurately, and by diminishing the tube trouble so many exposures are not necessary. The same massive radiation is not indicated in the treatment of tuberculous adenitis as in the treatment of malignant disease. It is much better to lengthen the exposures, and not to attempt to cure the patient with one or two massive doses, because we want to produce a constitutional improvement as well as a disappearance of the enlarged glands. No matter how wonderful the result, the patient should have good hygienic surroundings and not attempt work which is too strenuous, for a time at least.

The Roentgen ray is the best method of treatment when the glands have become widely scattered and are broken down. Where there is pulmonary involvement, Boggs believes the Roentgen ray, together with good hygienic treatment, is the only method to be considered. Early thorough operation cannot remove all tubercle bacilli which have invaded some of the smaller glands. When the Roentgen rays are employed early, suppuration seldom occurs. This treatment avoids sinus formation and disfigurement.

Prophylactic treatment is important, and has not received proper attention. Persons having unhealthy tonsils, adenoids, nasopharyngeal catarrh, bad teeth, etc., are predisposed to tuberculous adenitis. Until recently very little attention was paid to the source of infection. An effort should always be made to locate the channels of infection, although a great many cases are cured without finding the primary focus. Surgery is valuable and necessary, but when adenitis is treated by the Roentgen rays, it can be limited to from five to ten per cent of the cases.

RECURRENCE OF SYMPTOMS AFTER OPERATION FOR GALL-STONE DISEASE.

In the *Official Bulletin of the Chicago Medical Society* of May 31, 1916, we are told that DEAVER read a paper on this subject, in which he stated that during the period from January 1, 1910, to January 1, 1916, there were performed at the German Hospital 1031 operations upon the gall-bladder or biliary passages, with a total mortality of 7.18 per cent, or 74 deaths.

During the same period, and included in the above, there were 42 cases that had been operated upon previously for the same disease. Five of these had had two previous operations, and one had been operated upon three times without relief. The number of operations performed upon these 42 cases was 50. The operative mortality in this group was exactly 8 per cent, or approximately the same as in the whole series. The four fatalities were due, in one case, to uncontrollable hemorrhage, in another to the same cause plus leakage from a cholecystoduodenostomy, in the third from toxemia and exhaustion, and in the fourth, which was the case mentioned as having had four operations, death was due to acute pancreatitis in addition to carcinoma of the head of that organ. A considerable number of these recurrent cases had not been operated upon by him in the first instance, but he had no doubt that some of his original cases had reached the hands of others of his colleagues for secondary operations, so that it seemed likely that under the present conditions of surgery prevailing in this period about four per cent of all cases come to reoperation for persistence of recurrence of symptoms. The average interval between the first and second operation was twenty-two months, the longest period being nine years.

Twenty-two cases, or slightly more than half, were found to have one or more stones in different locations. In eleven cases, or exactly one-half the total number, the stone or stones were in the common duct, and in one case each they were found in the hepatic and common duct, in the cystic duct, and in the hepatic duct. In the cases showing stones in one or more of the ducts, it seems altogether probable that they were overlooked at the original operation, or possibly in the case of those in the hepatic duct they were beyond the possibility of surgical removal at that time. In three cases a single stone was found in the gall-bladder. One cannot say whether these single concretions were formed after operation or were overlooked. In the other eight cases of stones in the gall-bladder the number ranged from five to several hundred, and in several cases the conclusion was irresistible that they had reformed in that location.

From these cases it would appear that gall-stones are the most common cause of the recurrence or persistence of symptoms after operation. They make their presence known within a year and often within a few days or weeks. They are usually stones that have been overlooked or out of reach, but if the gall-bladder has been left, the possibility of reformation of the stones cannot be disregarded.

In the eight cases the cause of later trouble was either failure to dislodge the infection or a reinfection of the biliary passages and pancreas. Chronic and acute cholecystitis without stones was found in three instances and pancreatitis in five.

As to the type of operation predisposing to recurrences, it is evident that more recurrence took place after simple drainage of the gall-bladder than when it was removed. Thus, in half of the stone cases recurrence was due to calculi left or reformed in the gall-bladder. In one case stones were impacted in the cystic duct and would have been removed by cholecystectomy. When stones are overlooked in the common or hepatic duct, it is, of course, clear that the treatment of the gall-bladder is of no moment so far as subsequent obstructive symptoms are concerned. In the eight cases noted as simple infective recurrences, namely, cholecystitis and chronic pancreatitis, the gall-bladder had been removed in only one. Naturally cholecystitis cannot occur in the absence of

the gall-bladder, but in the five cases of pancreatitis only one had had a cholecystectomy. This is in line with the newer ideas of the part played by the gall-bladder as a chronic focus of infection from which the pancreas is often involved, and while the number of cases is small they serve to support the idea that unless it is needed for side-tracking purposes, it is better to remove the diseased gall-bladder when complicated by pancreatitis.

The superiority of cholecystectomy in respect to the freedom from recurrences is rather more than counterbalanced by the higher mortality of the operation.

The causes of recurrent symptoms following operation for gall-stone disease are the following: Late operation and extensive pathology; type of operation not adapted to the lesion; overlooking stones in the gall-bladder or ducts; reformation of stones; persistence or recurrence of infection of gall-bladder, ducts, or pancreas; insufficient drainage; adhesions, especially adherent duodenum, pylorus, or stomach; internal biliary fistula; external biliary fistula; contraction of papilla of Vater; stricture of the hepatic duct; chronic pancreatitis; pancreatic lymphangitis and interstitial pancreatitis.

The type of operation done must necessarily influence the result; for example, draining the gall-bladder when it should be removed, or *vice versa;* draining the gall-bladder externally when it should be drained into the duodenum; failure to drain when there is present a cholangitis, a pancreatic lymphangitis, or interstitial pancreatitis; omitting properly to explore the hepatic and the common duct; omitting definitely to determine the patulousness of the cystic duct when draining the gall-bladder; failure to recognize a stricture or a growth of the cystic, the hepatic, or the common ducts; failure to detect a stricture and to dilate to the normal the orifice of the papilla.

The most common error in operating for gall-stone disease is failure to remove all of the stones. Deaver says he has many times operated and removed a stone or stones that had evidently been overlooked at a previous operation. This, however, was not always the fault of the surgeon who performed the original operation. He has many times met with a gall-bladder full of stones, with the common, hepatic and two primary hepatic ducts also filled with stones.

Internal biliary fistula in the shape of cholecystogastrostomy, cholecystoduodenostomy, and cholecystocolostomy can be corrected only by severing the respective viscera and repairing the opening. In the majority of instances of this kind it may probably be best to excise the gall-bladder on account of disease of the same and to close the opening in the stomach, duodenum, or the colon, as the case may be.

In the treatment of external fistula, if the fistula is simply a gall-bladder one due, as is usually the case, to a stone obstructing the cystic duct, excision of the gall-bladder is the best practice, and if due to stricture excision is the only proper operation.

Contraction of the papilla of Vater, with consequent obstruction of the common duct, calls for dilatation of the papilla, carried out gradually through an incision into the duct.

Acute and chronic cholangitis are amenable to treatment only by bile drainage, best carried out by introducing a rubber T-tube into the common duct. Acute cholangitis is seldom seen except as a complication of infection of the gall-bladder or the common duct, and more often due to the presence of stone obstruction. Acute cholangitis due solely to inflammatory obstruction is comparatively rare; it does not differ from lithogenous obstructive cholangitis, and likewise calls for the establishment of free drainage.

Drainage can be made through the gall-bladder, if the cystic duct be patulous, and the condition of the gall-bladder warrants drainage. Drainage through the common duct is much more efficient and more reliable, and better suited, therefore, to bring about prompt results than is drainage of the gall-bladder.

Myocarditis, kidney degeneration, degen-

eration of the blood-vessels, diabetes, hematogenous infection, to say nothing of many other conditions, are the consequence of neglect—toxemia the result of gall-stone disease. The two most common sources of infection are the appendix and gall-bladder, the pathology of the appendix and gall-bladder having much in common.

Why are these operations so often done too late? The answer is, the patient's confidence in medicine; in the cures supposed to be brought about at the various springs, such as Carlsbad and others; the fear of operation and the advice of the physician who believes that many of the affections we are discussing are amenable to medical means. The arguments for and against medical versus surgical treatment must be based on pathological and anatomical facts as learned from making observations on the living and on the dead.

Neither vaccination nor serum treatment is applicable to biliary infection; in fact, there are no reliable medical measures that will remedy it. The much heralded "spring treatment," mud baths, and various other forms of baths prescribed, with the idea of causing metabolic changes for the betterment of the condition, can only be designated as temporizing measures.

THE PROBLEM OF TUBERCULOUS INFECTION IN CHILDREN.

DANA, in the *Boston Medical and Surgical Journal* of May 25, 1916, states that:

1. A large proportion of all children are infected with tuberculosis during childhood, and from this early infection most of the active tuberculosis of later life is believed to spring.

2. The general practitioner has not been interested in the diagnosis of these cases, and he has not awakened to the practical importance of such cases in the fight against tuberculosis. In fact he tends to deny the existence of such cases.

3. It is a safe general rule to follow that any child who shows constantly poor nutrition, fever, lack of vitality and ambition, abnormal pallor, or who is in other ways "below par," should have the benefit of fresh air and abundant suitable food, as well as frequent careful physical examinations by an expert.

4. Such cases should be sought for by the school physician, and when found should be followed along by the school or district nurse, who can take these patients to the local tuberculosis dispensary at stated intervals for examination. This need not necessarily interfere with the care of these patients by the family physician.

5. The *x*-ray does not distinguish, in general, between active cases needing active treatment and the latent or healed cases.

MIXED VACCINES CONTAINING BACILLUS TYPHOSUS, BACILLUS PARATYPHOSUS A, AND BACILLUS PARATYPHOSUS B, WITH REGARD TO THE REACTION PRODUCED AND THE ANTIBODY FORMATION.

In the *Journal of the Royal Army Medical Corps* for May, 1916, COPPINGER and GIBSON make a report on this subject and state that in summing up it is best to consider the reports on the reactions and the antibody produced together.

It is obvious that the dose of all three organisms should be kept as high as possible without the reactions becoming excessive. Small doses of a vaccine do not produce as good antibodies as large doses, and therefore one may reasonably expect that the immunity conferred is less in the case of the small doses without there being any direct relation between the two. In this series of experiments the most severe reactions taken all around were experienced among the men who received a single dose of one cubic centimeter of a vaccine containing a broth culture of bacillus typhosus, diluted to a strength of 1000 million, and bacillus paratyphosus A and B, of each in the case of Group A 500 million, and in the case of Group C 750 million.

In conjunction with this marked reaction they see a slow rise in the antibody production against bacillus typhosus. In the case of men in Group B, in which an agar vaccine of bacillus typhosus was used, a much

quicker rise in the antibody elaboration goes hand in hand with a less marked though longer delayed reaction.

This discrepancy between the agar and broth bacillus typhosus vaccine is lost sight of by the end of the third week, after which the titres of the two sera were found to stand at the same level.

They were unfortunate in losing sight of the men inoculated with the agar vaccine so soon, as they have always thought that protection afforded by a broth vaccine lasts longer than that produced by the same organism grown on agar. They think that this may be explained by the fact that an organism grown in broth is more liable to autolysis than if grown on agar. On account of this autolysis, the dose of a broth vaccine is really higher than that estimated, while at the same time it necessarily becomes more toxic.

In the case of B. paratyphosus A there is very little to choose between a single dose of one cubic centimeter containing 500 million and a single dose of the vaccine containing 750 million, as at the end of six weeks the titre of the first is 1 in 20 and that of the second 1 in 40. The effect of the larger dose is slightly more marked in the case of B. paratyphosus B.

Turning to the results with the double doses of 0.5 and one cubic centimeter of the vaccines containing the two strengths of the paratyphoid bacilli, the reactions were not more marked than in the case of the old antityphoid vaccine, and very much less marked than in the case of the single doses of the mixed vaccines.

On the other hand, much more agglutinin was produced, and in this case the administration of the larger doses of B. paratyphosus A and B produced a higher titre for A and B at the end of six weeks than did the smaller dose. In the case of B. typhosus, of course, the same dose was given in each case, and the titre of sera was identical.

Another curious fact which has come to light in the course of these experiments is that whereas in rabbits they found that B. paratyphosus A in the vaccine produced more agglutinin in the sera than did B. typhosus or B. paratyphosus B, yet they could not demonstrate thermostable opsonins for this organism any more than they could in the case of man (the same strain being used in each case). From these experiments the following conclusions may be drawn:

1. The highest dosage used is the best for producing lasting antibodies against these three organisms, and the vaccine should be given in two doses rather than in one, both on account of the reaction produced by the single dose of one cubic centimeter, and also on account of the higher antibody content produced when the two doses are given.

2. The want of antibody production for B. paratyphosus A is a very strong feature of these experiments when compared with those elaborated for B. typhosus and B. paratyphosus B. As to the immunity produced against this organism, that can only be decided by actual trial, but the results obtained in the course of these experiments seem to point to the fact that the B. paratyphosus A content of the vaccine may not achieve its object to the same extent as that of B. typhosus and B. paratyphosus B.

THE PROBLEM OF RINGWORM IN CHILDREN.

In the *Boston Medical and Surgical Journal* of May 25, 1916, OLIVER reaches these conclusions:

1. Ringworm of the scalp is a highly contagious disease.

2. The older methods of treating ringworm of the scalp are inefficient.

3. The treatment of this disease with *x*-rays, placed upon a practical basis by Sabouraud and Noiré, has proved to be highly efficient. In Paris it has shortened the course of the disease from two years to three months.

4. The objection to the use of *x*-rays in ringworm, on account of the possibility of producing permanent baldness, owing to inability to measure the rays properly, seems to be answered by the introduction of the Coolidge tube, with which the

amount of rays absorbed can be measured with great accuracy.

5. Radiologists as well as dermatologists, in the United States, have been slow to grasp the importance of the *x*-ray treatment of this disease, but it is to be hoped that, before long, all cases will be treated by this method, which, while it probably will never eradicate the disease, should make it much less frequent in the future than in the past.

THE ABUSE OF TINCTURE OF IODINE.

The *New York Medical Journal* of May 20, 1916, says it is obvious that the dressing of a recent infected and suppurating wound ought not to be the same as that of one in process of rapid cicatrization; in the former case an energetic antiseptic action is required, which, in the latter, could do only harm. Nigay (*Journal de Médecine de Paris,* April, 1916) has noticed a custom among dressers of using a routine procedure of (1) cleansing; (2) two or three applications of a ten-per-cent iodine solution; (3) application of a dry compress. Such a routine may injure the finer cellular layer which is at the basis of cicatrization, and iodine in such strength may even destroy the healthy epidermis, or cause a patch of eczema, especially if it is not freshly prepared and hydriodic acid has formed. Nigay remarks that this acid may be destroyed by adding one per cent of iodic acid (HIO_3), which in the presence of hydriodic acid forms iodine and water. The addition of four per cent of potassium iodide will also destroy the irritating acid. The 95-per-cent alcohol of the tincture is, according to Nigay, too irritating to be applied to a healing wound; its great affinity for water dehydrates the cells and coagulates albumin. Reclus never used an iodine preparation stronger than one in fifteen of alcohol—about the strength of U.S.P. tincture—and always insisted on a fresh preparation. Nigay thinks that even this formula of Reclus may cause damage if used too freely, and he has seen many wounds which were doing badly under its application heal beautifully after it was stopped.

The final application of a dry dressing, according to the writer, is a mistake, as it is almost invariably too tight, and when removed with the speed required in military hospitals, generally takes with it an important layer of reconstructed tissues. Nigay's own method of treating wounds comprises irrigation without pressure, gentle wiping with a dry compress, and the application of an ointment—for example, that of Reclus:

> Corrosive sublimate, 0.03 gramme;
> Phenol in crystals, 0.30 gramme;
> Salol, 1 gramme;
> Iodoform, 0.50 gramme;
> Antipyrin, 5 grammes;
> Boric acid, 5 grammes;
> Sterile petrolatum, 40 grammes.

Where this ointment is not easily obtained, Nigay uses a four-per-cent salol ointment or even sterilized petrolatum alone. Such treatment, he says, has proved more efficacious in his hands than that of the indiscriminate application of iodine, a precious agent indeed, but not to be used without care and discretion.

VACCINE TREATMENT OF CHRONIC SUPPURATIVE OTITIS MEDIA.

In the *Pennsylvania Medical Journal* for May, 1916, COATES and ERSNER point out that miracles must not be expected from vaccines, as they are expected from the use of antitoxin in diphtheria, for in many of their patients four or five vaccines were prepared before the ears became dry. It must be remembered that vaccine therapy is simply stimulating antibody formation, or, as Vaughn would have it, of "proteid-splitting substances." Each area of inoculation becomes a little laboratory and storing center, from which these antibodies gradually find their way into the circulation to combat the ailment.

Since all the complement fixations were negative, they conclude either that (*a*) it is possible that only a few free amboceptors are circulating in the blood in these cases; (*b*) the bacteria in a discharging ear are too attenuated to stimulate antibody production; (*c*) a lowered vitality of the body may

antagonize the response to the infection; (*d*) the pathological tissue in the middle ear, as indicated above, does not respond to the vaccines as healthy tissue will, and what holds true in the case of vaccine should also be true for direct infection; (*e*) the area may be so well walled off that absorption cannot take place; (*f*) the technique for complement fixation employed was probably not delicate enough, and possibly in time a more sensitive test will be evolved, yielding better results.

These theories are only speculative, however. The question is how to overcome chronic suppurative otitis media, and in order to accomplish this we must in some way stimulate the body. Having no direct means to stimulate the body, other than by expectant treatment, vaccine is recommended as such a body stimulant, exclusive of the fact that dry ears may thus result.

It is advisable for esthetic and hygienic reasons to continue with local treatment.

Subcutaneous inoculation is most satisfactory, for antibody formation can only be expected in healthy tissues, and failures resulting from administering vaccine directly into the middle ear would seem to prove that pathologic tissue cannot produce antibodies.

The utmost effort should be made to discover a method whereby we can tell whether the causative bacteria have been obtained, as otherwise vaccine therapy will remain empirical in chronic suppurative otitis media. They failed in their complement fixation tests with the three antigens composed of polyvalent strains of staphylococcus, pyocyaneus, and pseudodiphtheria, but they hope to obtain more strains to work with, and to report at some future date.

From the fact that the twenty-one Wassermann tests for syphilis were all negative, it seems evident that this disease did not play any appreciable part in the results obtained in this series, and, particularly, that it did not account for the failures. Of the twenty-five von Pirquet tests for tuberculosis four were significant and three others were suggestive. As these cases were all in adults, whose middle ears showed none of the accepted signs of tubercular invasion, and from whom no tubercle bacilli were recovered, it is possible that there was some old, healed focus elsewhere in the body. In spite of the negative histories, and the general healthy appearance of these seven individuals, the positive reactions may indicate a lowered vitality of resistance that would, in part at least, account for the failure to raise the body immunity against the specific organisms.

To those patients who were discouraged with the vaccine treatment, and to those waiting for new vaccines to be prepared, a solution containing one-half a grain of emetine hydrochloride was instilled into the ear, with the idea that the ameba buccalis might be prolonging the suppuration. There were no improvements, with the exception of one patient who was a diabetic, and who also had pyorrhea alveolaris and bilateral suppurative otitis media. After searching for several weeks the ameba was found in the warm specimen of pus from the middle ear, and in their enthusiasm they immediately administered emetine hydrochloride, in addition to autogenous staphylococcus vaccine. The eczema of the external canal subsided, the right ear became dry, but they were unable again to recover ameba from the discharge in the ear.

THE TREATMENT OF SYPHILIS DURING THE FIRST SIX MONTHS AFTER INFECTION.

In the *Cleveland Medical Journal* for April, 1916, CORLETT points out that the early eruptive, or for convenience of description the second, stage of syphilis is the one most frequently encountered by the medical attendant. Here every structure of the body is thoroughly involved, particularly the tunica intima of the blood-vessels, and scarcely to a less extent the internal viscera and the cerebrospinal structures. Here, again, time is of the greatest importance, for the inflammatory changes set up by the presence of spirochæta lead to destruction and, in the main, constitute the sequelæ of syphilis. Salvarsan, or its equivalent, is in-

dicated in consequence of its rapid parasitotropic action and consequently is the best preparation to be used.

The dose depends on the body weight, and in general may be estimated at from 0.3 to 0.6 gm. It is best given intravenously, and repeated at weekly or ten-day intervals, until from four to ten have been given. The frequency of administration as well as the size of the dose to be given depends on the reaction, if any, which follows each dose. Usually it is slightly if at all noticeable. As to the number to be given, the Wassermann tests, when made with sufficient skill and care be exercised, furnish the best means of determining this point. Should it become negative, it is well to discontinue salvarsan, and after an interval of two weeks, care being taken that the tubules of the kidney show no evidence of irritation, recourse may be had to intramuscular injections of mercury.

If, on the contrary, the patient be first seen toward the end of the first six months after infection, and no intensive treatment has been followed, then the indication for salvarsan is not so clear. In the absence of any complication or involvement of important structures, such as the eye, salvarsan or mercury may be instituted and the need of pushing either to its full tolerance is less urgent. Whichever drug is selected—and again in this instance Corlett prefers the former—the best results are obtained by a change before the spirochætæ become accustomed and to a certain degree immune to the spirillicide. This may not occur for several months, but it is well to bear in mind. Mercury is slower in its action and may be continued over a longer period, although it is advisable to supplement its use by suitable periods of rest. The most potent form of mercury is the gray oil (oleum cinereum), in 1.5 gm. of which about two grains of metallic mercury is injected weekly intramuscularly for six weeks, followed by an interval of six weeks before the second course is given. Since many fatal results have been reported it should not be given except under the most careful attention to details. First it must be ascertained that no involvement of the tubules of the kidneys exists, and that the other eliminative organs are functioning properly. When there is evidence that the drug is not being absorbed, as when the therapeutic effect is arrested or none is obtained, its use should not be persisted in, but recourse should be had to one of the soluble salts of mercury. Again, on the first symptoms of ptyalism it should be stopped.

The technique is also of importance. Care must be taken to separate the cylinder of the syringe from the needle after its insertion, to see that a blood-vessel has not been entered, and a fatal dose be thrown directly into the circulation. With these precautions carefully observed by one sufficiently skilled, a minimum amount of danger attends its use.

Calomel suspended in paraffin is likewise one of the strongest preparations of mercury thus employed. The dose is .065 gm. or one grain given intramuscularly once a week for ten weeks, followed by a rest period of from four to six weeks. The objection to calomel is that it is more often painful than milder preparations, and fatal results have also been reported. The salicylate of mercury, from 10 to 20 per cent in paraffin, of which from 0.6 to 0.9 Cc. (ten to fifteen minims) are injected once a week for fifteen weeks, is the mildest form of the insoluble preparations of mercury. It is also efficient, as the results obtained during a period of more than twenty years have demonstrated.

For ambulatory cases these insoluble forms of mercury are to be preferred because they are efficient, devoid of danger if properly given, and the patient is relieved of making biweekly or more frequent calls on his physician. On the other hand, the soluble salts of mercury are quickly absorbed when given hypodermically or intramuscularly, are less painful, and are less liable to be followed by painful nodules, which sometimes occur when the insoluble salts are used. In other words, less care and skill are required in their administration. When a quick action is required, and salvarsan is not selected, this is the method

of choice, particularly in hospital practice. The preparations most commonly given are either the bichloride or the biniodide. The former is more generally given, as in the following formula:

℞ Hydrargyri, 0.50;
Sodii chloridi, 0.25;
Aquæ destillatæ, 30.00.

Of this from 0.9 to 1.2 Cc. (fifteen to twenty minims) is injected two to three times a week.

From an extensive use Corlett can recommend this:

℞ Hydrargyri, 0.06;
Sodii iodidi, 0.06;
Aquæ destillatæ, 15.00.

Of which 0.6 Cc. (ten minims) is injected as in the above. It is claimed that with the former an albuminate forms, thus impeding its absorption; clinically Corlett has observed no evidence of this, and it seems of equal value to the latter in the therapeutic results.

With mercury, therefore, the cycle is complete, and as in the time of which Antonius Chaumette wrote, the intensive use of the drug is again employed, but fortunately with less dire results to the patient.

In the treatment during the first six months, the ingestion of antiluetic drugs by the mouth has no place. Nor can we expect, excepting possibly in the abortive stage, to cure syphilis in this period of time, although more may be accomplished toward its elimination than during any twelve months later in its course, and Corlett believes all of the complications and sequelæ may during this time be reduced to a fractional percentage.

THE TREATMENT OF ANTERIOR POLIOMYELITIS.

The *New York State Journal of Medicine* for August, 1916, contains an article by WALLACE on this important topic. He discusses the treatment in detail:

1. Stage of onset: May last several days, may be brief or entirely absent.

The vast majority of the cases observed by the author during the epidemic in New York City in 1907 began suddenly with fever, some nausea or vomiting, constipation, malaise, headache, sometimes convulsions, and pain around the joints and in the muscles; but a few had no general symptoms or they were overlooked, they having been well and healthy before retiring, and a limp or loss of power upon arising was the first intimation that they had suffered an attack.

Prevention is the most important thing to be considered. Various carriers have been suggested, but in all probability the human being is the one that offends most frequently. The patient should be isolated for at least six weeks, in a room from which all curtains, rugs, and whatever other furnishings that might catch the dust, have been removed. Those coming in direct contact with the patient should carry out about the same routine as in diphtheria and typhoid fever. The mouth and nose should be kept clean by some mild antiseptic solution. Handkerchiefs, cloths, and excreta should be destroyed, and the floors wiped daily with a wet cloth.

The treatment of the patient's symptoms at this time is very important. A thorough evacuation of the bowels by administering castor oil, calomel, or Epsom salts, and an enema, is not only beneficial to the intestinal tract, but also relieves much of the congestion in the spinal canal. Urotropine in doses of from two to three grains, every four hours, has been prescribed with questionable benefit, for its effect upon the contents of the cerebrospinal canal. Salol from two to five grains also may be used as a gastrointestinal disinfectant. Heat over the spine and tender muscles and joints is most efficacious in relieving the pain. For the respiration and heart, atropine and strychnine may be given, and the latter, perhaps, might be continued during the first year for its tonic effect upon the muscles. Absolute rest is an essential feature of the entire treatment during this stage. The patient should be placed upon a bed which permits of no sagging, preferably a fracture bed, and in a room that is kept thoroughly ventilated. Plaster of Paris bandages should be applied

to the feet in order to prevent contractions of the tendo Achillis, and the weight of these bandages will also help in combating the efforts of contraction of the flexors at the hips and knees.

2. Stage of apparent paralysis:

When the condition of the patient simulates that of complete paralysis of many groups of muscles and several of the supposedly paralyzed muscles regain their power, it may be called the apparently paralytic stage. Prolonged bed treatment for two or three months, if the onset was severe, prevents back deformities. Daily sponging with alcohol, and skin rubbing to avoid decubitus, should not be forgotten. Hot fomentations and baths may be given for the pain during the first week or ten days. In the bulbospinal type, all movements should be restricted, especially sitting up. The adult will coöperate in this treatment, but the child may have to have his trunk and lower extremities incorporated in plaster of Paris, from his axilla to his toes, or some form of back brace with limb parts attached, in order to control him.

3. Stage of recovery or convalescence:

During this period, which for our purposes is from the third month to the second year, daily muscle massage should be given and manipulations and stretchings of the active muscles are indicated. Braces are used to protect against severe strain of the paralyzed muscles, stretchings of the ligaments about the joints, and to avoid contractures of the healthy ones. Overbracing is preferable during the earlier months, after which it is gradually diminished as the strength of the part returns. Electrotherapeutics may be of some value and should be used during the first year. The faradic or interrupted galvanic currents are suggested. Small doses of strychnine are used as a muscle stimulant.

4. Readjustment of permanent paralysis:

The vast majority have some muscles of the legs permanently paralyzed, and one can determine the exact muscles by the loss of voluntary contraction, the disappearance of the belly of the muscle due to atrophy, or by aid of the electrical current, applied to the individual muscles which will give reaction of degeneration. Continued improvement may be expected in the afflicted member perhaps several years after the onset, provided it is correctly braced and supervised. Functional use should be encouraged under the protection of apparatus.

The joints of the supporting machine should be carefully selected; the aim should be to permit motion in the direction of the muscles about the articulations, which have been put out of commission. Theoretically this allows shortening of the ligaments and tendons that receive their nerve supply from the degenerated nerve cells. In other words, every endeavor should be made to maintain the muscle balance of the member in a physiological attitude.

Muscle education is contraindicated. The attempts to train and to develop paralyzed muscles are not only useless and wasteful, but are detrimental. To give patients sitting-up exercises, especially the trunk or back ones, when loss of power occurs on one side of the vertebral column, causes severe rotary lateral curvature. This has been frequently practiced by others and has aggravated the deformity by overdeveloping the well muscles. The sane treatment of these backs is the application of plaster of Paris jackets or proper back braces, in order to prevent the deviation. When this has occurred one's efforts at correction cause the patient considerable discomfort and they are not always successful. As previously mentioned prolonged recumbency in a horizontal plane during the earlier months is a most potent prophylactic agency for such a condition.

If the foregoing mechanical and therapeutic steps are followed, many unsightly malformations will not occur, and at least one-fifth of the operations upon this class of patients will be unnecessary, because about this proportion of them are done for contractures.

The operative treatment for the disabilities and deformities following anterior poliomyelitis offers a most prolific field, but no case should be operated upon without a careful study of it, and one should be con-

vinced that material benefit will be rendered to the patient. We must look forward to the time when the patient arrives at the age of deciding matters for himself, and will upon his own responsibility discard all apparatus no matter what his condition may be. It is one's duty to have him in the best possible shape for locomotion.

Multiple contractures existing in an individual should be treated by stretching of some of the muscles and tenotomizing subcutaneously some of the strongest ones. It is often advisable to do this at separate times, because of the risk to the patient when done too strenuously. It often happens that the power of dorsal flexion of the foot is regained, although the extensors seem paralyzed because of the severe equinus, when the tendo Achillis is lengthened. The preference is again given to the subcutaneous method, and care should be taken not to bring the foot up to more than two or three degrees less than a right angle to the leg.

Tendon transplantations for paralysis of muscles going to the foot have not been valuable, as they do not stand the test of time. It is almost impossible to balance the body weight upon the astragalus when either the anterior, posterior, or lateral group of muscles are paralyzed. One therefore advocates the removal of this bone in order to get a firm weight-bearing foundation. Tendon transference thus supplemented produces a much improved foot when varus or valgus deformity is present. The operation of removing the astragalus, displacing the foot backward, and utilizing the peroneals as a stay by suturing them to the tendo Achillis, advocated by Dr. Royal Whitman, gives the best obtainable foot when its deformity is one of calcaneus, calcaneo-valgus, or dangle-foot. When successful this gives a firm base for standing and walking. The circulation to the foot is improved, and the ability to use it without a brace stimulates the growth of the entire limb.

When the quadriceps extensor tendon is paralyzed and both hamstrings are strong and active, the implantation of the stronger of these often restores active extension of the leg and prevents recurvatum. The success of this operation permits the patient to set aside his braces.

The lasting effect of any operative procedure depends upon assiduous and vigilant after-care. The correct attitude should be maintained for months and the patient seen at frequent intervals. Warning should be given that too much strain or liberty to the operated member may prevent obtaining an ideal result.

ADRENALIN IN POLIOMYELITIS.

HAAS in the *Medical Record* of Septemtember 2, 1916, writes that during the course of an epidemic of a disease the therapeusis of which is still unsettled, it would appear wise to report cases upon which the newer procedures were tried, that the results of such procedures may stimulate or discourage further application.

The following three consecutive cases of infantile paralysis were seen in consultation. The treatment consisted of adrenalin administered intraspinally, after the withdrawal of cerebrospinal fluid, and in one case the use of immune serum in addition.

Case 1.—Boy, six years (bulbar type); ill three days; temperature 105°; glands enlarged at angle of jaws; supposed to be suffering from nasopharyngitis. The symptoms were vomiting, inability to swallow, irregular respiration, involuntary evacuation of urine and feces. The child was in coma, there was retraction of head, the occiput rested upon spine, the sclera only showing; respiration of the Biot type; Macewen, Brudzinski, and Kernig signs present. Knee-jerks absent, temperature 105°, pulse 120, respiration varying from 1 to 30 per minute, condition growing constantly worse. Spinal puncture performed and 70 Cc. clear fluid withdrawn; 6 Cc. 1:1000 adrenalin administered by gravity; convulsive twitching followed procedure for several hours. Six hours later condition was no worse than when puncture was done; a second puncture was made, and was a dry tap, although repeated attempts were

made to withdraw fluid; no adrenalin was administered at this time. The condition continued to improve. After twelve hours there was a short period of consciousness; the child was able to swallow teaspoonful doses of water; respiration was less irregular.

Eighteen hours after the withdrawal of fluid and administration of adrenalin the child was conscious, rigidity was almost absent, he swallowed well, respiration was regular, temperature 99°, and except for weakness of all muscles the boy was apparently not very ill. Three weeks after onset he was entirely normal except for slight weakness in the lower extremities, which is growing less daily, and which does not interfere with walking.

Case 2.—Boy, 4½ years (bulbar type); symptoms similar to those in Case 1, except that respiration was not so seriously affected. An intraspinal adrenalin injection was given forty-eight hours after onset of acute symptoms, and repeated four times. Immune serum was once administered intraspinally. Recovery from severe symptoms required four days. Two weeks later the boy was entirely normal except for slight weakness of the external recti muscles of both eyes.

Case 3.—Boy, 2½ years (spinal type); paresthesia marked; ill five days, with irregular temperature and symptoms. There was slight rigidity of the neck; Brudzinski and Kernig signs present; knee-jerks absent. Paralysis of all extremities and muscles of chest; involuntary evacuation of urine and feces. Temperature 103°, pulse 130, respiration regular but difficult. Spinal puncture was performed twenty-four hours after acute symptoms appeared—60 Cc. clear fluid withdrawn, and adrenalin administered as above; this was repeated once. Temperature normal after seventy-two hours. Fourteen days after the first puncture there was complete restoration of the upper and left lower extremities, with partial restoration of the muscular activity of the right lower extremity.

The foregoing cases are briefly reported, not as showing results of treatment, but to place on record the experience with a procedure which is apparently harmless and full of promise. The only untoward result of this therapeutic measure was a rather severe urticaria appearing within twenty-four hours in Cases 1 and 2.

In contrast with the results in the foregoing cases are five cases of this disease seen prior to them in which no intraspinal injections were given. Two died of respiratory paralysis. One has a spastic paraplegia of both lower extremities after six weeks. One has a flaccid paralysis of both lower extremities after eight weeks. One has made a complete recovery. It would appear that the ideal treatment in the light of present knowledge and experience consists of: (1) Early puncture and withdrawal of cerebrospinal fluid; (2) administration of adrenalin intraspinally; (3) followed immediately with the introduction of immune serum or, in its absence, normal serum.

THE PRESENT STATUS OF MAGNESIUM SULPHATE IN THE TREATMENT OF TETANUS.

The *Archives of Internal Medicine* of May 15, 1916, contains an article by ROBERTSON in which he reviews this question in its entirety and makes special reference to the latest "magnesium" article by Meltzer, printed in both the *Berliner klinische Wochenschrift* and the *Lancet*. He first emphasizes the possibility that the cause of death in tetanus may be a direct result of the severe and exhausting spasms, and that, by controlling these with magnesium sulphate, the life of the patient is lengthened and thereby his chances of recovery are increased, because of the formation within the body of antitoxin and the ability of the affected nerve cells to return to a normal state. He believes that magnesium narcosis is due to the passing of the magnesium sulphate out of the lymph stream into the free space which contains the points of contact of the branches of two or more neuron systems, where the salt interrupts the conductivity of afferent and efferent impulses through the neurons. Thence arises the

narcosis, the analgesia, and the relaxation of muscles.

In discussing the various modes of administration, attention is directed to the following points: The dosage by the intraspinal route should be 1 Cc. of a 25-per-cent solution for every 10 kg. (22 pounds) body weight; the effect of a 25-per-cent solution, which is nearly molecular, is sharper and more certain than that of less concentrated solutions, and there is no clear evidence in the literature showing any toxic action of such injections on the heart; in cases of respiratory disturbances (which in his experience are very frequent) one needs only to wash out the spinal canal with physiological saline, remembering that calcium chloride, physostigmine, or eserine does not afford relief in this particular method; and, finally, in children Kocher's failure with the intraspinal method and Falk's success with the subcutaneous are perhaps due to the more rapid diffusion in the subdural and arachnoidal spaces of brain and cord in children, compared with adults, as well as the more rapid absorption of the salt from the subcutaneous tissues of the former.

The subcutaneous method gives a slower and hence a possible cumulative action, so that small doses frequently repeated are sufficient in many cases to produce a continuous effect. He emphasizes the sharp distinction to be made between subcutaneous and intramuscular injections, the latter acting in a much more rapid and hence more toxic manner. Therefore, caution is to be used not to penetrate accidentally too deeply with the injecting needle. The fact is reiterated that magnesium salts energize the anesthetic properties of ether so that a combination of the two in small doses leads to a deep narcosis and relaxation which is of considerable duration. Chloroform and other narcotics do not possess this property to nearly so marked a degree. He states that nephritis contraindicates the method for (at least) surgical anesthesia. Meltzer notes that a signal advantage of the subcutaneous method is the ease of controlling any dangerous effects of the drug; the administration of 1 mg. of physostigmine or eserine (0.0015 gm.), the injection of an isotonic solution (about 2 per cent) of calcium chloride into the muscles in doses of about 50 Cc., or into the veins of a 2-per-cent solution in physiological saline up to 500 Cc., being sufficient to remove at once the depressive action of the magnesium salt.

Lastly, in the routine treatment of tetanus Meltzer recommends starting with a subcutaneous injection of 0.3 gm. or 1.2 Cc. of a 25-per-cent solution per kilo (about 10 Cc. for a normal male adult), repeated four times a day. If severe spasms occur, ether should be used and the dose of magnesium increased to 0.5 gm. per kilo (16 Cc. of 25-per-cent solution for adult male). The bladder may need to be emptied by catheterization. In case of danger from respiratory failure one can resort to the remedies mentioned above as well as the application of an Esmarch bandage to hinder absorption of the salt. In desperate cases artificial respiration should be used. If the symptoms are too severe or the subcutaneous injections fail, the intraspinal method is advised. Antitetanus serum should always be used.

To this admirable summary of this subject by Meltzer there is little to add in conclusion. There can be no doubt in the minds of those who review the evidence that in magnesium sulphate we possess a most valuable addition to our armamentarium in the treatment of tetanus. No such imposing array of facts can be brought forward in favor of chloral or allied narcotic agents, even granting their occasionally apparent good effects.

One further point needs emphasis. It is clearly evident that the drug must be used boldly, if its maximum therapeutic effect is to be obtained; that this bold use is subject to certain dangers, undoubtedly greater in some patients than in others; that these dangers, when threatening, may be rapidly relieved by simple and easily applied measures; and that, therefore, while this salt is being used, the patient must be under continuous expert attendance, with preparations already made to administer, rapidly, restor-

ative remedies. In Robertson's studies of the treatment of tetanus both in man and in animals he has been struck by the need of constantly watching the patient's condition. The disease at its best is a most desperate one, and the remedies must be used as soon as possible and their therapeutic limits attained at the earliest possible moment. It is only in this way that good results may be expected in severe cases. We watch a patient under anesthesia, a woman in childbirth, a case threatened with internal hemorrhage. How much more important in tetanus, with almost sure death before us, that we employ our resources to the limit and immediately meet every change with the necessary maximum therapeutic measures.

The treatment of tetanus has not yet reached the ideal stage. Prophylaxis of all dirty wounds is still our surest weapon of defense. However, it is difficult to avoid the conclusion that in outbroken cases, in addition to antitoxic serum, one's duty is sadly neglected if early, vigorous, and continuous efforts are not made to control the spasms, relieve the distress and pain, and give rest and nourishment by subcutaneous injections of magnesium sulphate in amounts large enough to bring about the desired results.

CHRONIC INTESTINAL STASIS FROM THE VIEW-POINT OF THE INTERNIST.

AARON, writing in the *Buffalo Medical Journal* for August, 1916, tells us there is no treatment that has given him better results in chronic intestinal stasis than Fleiner's oil cure. This consists in injecting into the rectum once daily 250 to 500 mils (½ to 1 pint) of olive oil. He has used pure cottonseed oil with equal benefit. The oil is to be retained in the bowel for a considerable time; it is best to retain it over night if possible. These injections are continued several months, at first daily, later every other day, and subsequently twice a week.

In cases of spastic constipation the oil has a soothing effect on the mucous membrane, thus relieving spasm; and in atonic constipation it strengthens the muscular tonus. Besides, it lubricates the gut, softens fecal agglomerations, and forms a protective layer upon the damaged mucous membrane.

When there is putrefacation, lactic acid may be prescribed, best in the potential form of the Bulgarian bacillus. The cultures are available in liquid and tablet form. The efficacy of this treatment is enhanced by a diet preponderantly carbohydrate and by restriction of proteins. The intestinal flora should show a change after a few days.

TREATMENT OF CARRIERS OF AMEBIC DYSENTERY.

DALE in the *Lancet* of July 29, 1916, says that the treatment of entamebiasis in England during the past year has been largely concerned with the problem of freeing the chronic "carriers" from their infection. Experience in Egypt in dealing with patients who continue to pass cysts after the dysentery has completely cleared up seems to have led to the conclusion that a full course of 10 or 12 grains of emetine hydrochloride, given hypodermically, will practically always eradicate the infection. The experience in England, to judge from hospital records which Dale has had the privilege of seeing, does not altogether tally with this; for there seems to have been a not inconsiderable proportion of cases in which such a course of emetine has led only to a temporary absence of cysts from the feces, followed by an early recurrence. These cases, relapsing into cyst-passing again and again after successive courses of emetine, have presented a difficult problem to the medical officers in charge of them. Their frequent occurrence among the cases treated in England was to be expected, for these consisted largely of cases which had undergone relapse into chronic "carrying," after apparently successful treatment of their acute infection with emetine; others had probably never been freed, by repeated dosage with emetine, before their return to England; while others, again, were appar-

ently "contact carriers," with no history of previous dysentery or treatment. It was clearly a matter of importance that these men should be freed from the danger to themselves and to others entailed by the persistent focus of infection.

The pathology of the chronic carrier of entameba histolytica seems to be still imperfect in that it has not been definitely ascertained whether the cyst-producing entamebæ are living freely in the intestinal contents, like entameba coli, or are localized in a partly healed pocket or sinus. The occurrence of liver abscess without acute dysentery seems to favor the latter supposition. In either case the relative failure of hypodermic treatment with emetine in this condition could be explained by the entameba being more or less completely shut off from the circulation and tissue fluids of the patient. The alleged superior efficiency in these cases of the older treatment with ipecacuanha by the mouth is in line with such a conception. By these considerations Dale was led to suggest a trial, in cases refractory to hypodermic emetine, of oral administration of this alkaloid in the form which gave promise of combining the advantages of the ipecacuanha treatment with freedom from its notorious difficulties and drawbacks. The results have been so far promising that it seems worth while, in the interests of a wider trial, to make mention of them at their present stage of incompleteness.

The compound which has been used is a double iodide of emetine and bismuth which was described last year by Du Mez, who suggested it as suitable for oral administration of emetine. It has the useful property, from this point of view, of being practically insoluble in dilute acids, but soluble with comparative ease in weak alkali. It might be expected therefore to pass the stomach unaltered, and then, being dissolved in the alkaline juices of the duodenum, to undergo gradual decomposition as it passed along the bowel, with liberation of emetine and precipitation of bismuth sulphide. Du Mez obtained promising, but rather irregular, results on dogs to which he gave the compound. So far as Dale has been able to ascertain it has not hitherto been tried clinically.

Dale's colleague, Dr. Barger, prepared a sample of this double iodide, and Dale tested it, in the first place, on cats. He found that large cats, weighing upward of 3 kilogrammes, could take repeated doses of 40 milligrammes without vomiting, the only effect being some looseness of the bowel. Sixty milligrammes (containing about 20 milligrammes of emetine) produced vomiting, but the fact that this occurred some five hours after the administration, while purgation occurred about one and a half hours after the drug had been given, indicated that the vomiting was not due to direct irritation of the stomach, but was secondary to liberation and absorption of emetine in the bowel, and therefore comparable to the vomiting which follows a large hypodermic dose. If treatment with these larger doses was continued, the symptoms of chronic emetine poisoning, which Dale has previously described, made their appearance, as with hypodermic administration.

A TREATMENT FOR PRURITUS ANI.

In the *Bulletin of the Johns Hopkins Hospital* for August, 1916, STONE tells us that the success of alcohol injections for producing localized lasting anesthesia, in facial and other forms of neuralgia, suggested the application of the same principle to the abolition of unpleasant sensations about the anal and perianal regions. The alcohol, of course, produces its effect by destruction of the nerve fibers with which it comes in contact. Hence, in essential principle, such a treatment is quite analogous to the Ball and Lynch operation, in which the cutaneous nerves are destroyed by direct mechanical division, instead of by chemical attack. The alcohol method presents certain definite advantages that will be referred to later; there are certain possible advantages, also, that will be considered at once. Since there is no selective action of alcohol, by which

motor nerves are spared, and only sensory ones are injured, one might expect a loss of sphincter control, if the injections were allowed to come in close contact with the motor branches to the muscles. Moreover, an injection of a substance causing tissue destruction, if too superficially placed, might be expected to cause a slough and resultant ulceration.

In order to test these possibilities by actual experiments, alcohol injections were made into the anal region in dogs, the depth of the introduction being varied. Without detailing the protocols of experiments, the following facts were clearly proved: Alcohol injections will produce complete local anesthesia. If introduced deeply enough to come in contact with the motor nerves, sphincter paralysis and resultant incontinence are produced. If introduced quite superficially—that is, within the skin itself—superficial sloughs are caused. It is quite possible, however, and not very difficult, to produce anesthesia without sphincter paralysis or skin ulceration; this effect is brought about by introducing the needle entirely through the skin, and injecting the alcohol immediately under the skin and never more deeply.

The method has been tried by Dr. Arthur Hebb and the writer in the dispensary of the Johns Hopkins Hospital and in their private practice on 17 cases so far, during a period covering less than two years. The facts observed are as follows: With the technique employed there is not much pain associated with the injection. There is some soreness during the first twenty-four hours, after which the only subjective sensation remarked is numbness. The itching is immediately abolished and the area injected is largely or completely anesthetic. No case so far has shown the slightest evidence of disturbance in the action of the sphincter. There were several cases in which small superficial sloughs resulted, but these all healed promptly and without difficulty. They were due to faulty technique in placing the alcohol too superficially, a fault due to the careful avoidance of too deep an injection and to the fact that the folded, irregular surface of the skin about the anus renders it much more difficult to keep the injections at a uniform depth than would be the case were the surface level. How long the freedom from itching will last is not known. One patient returned for a second injection eight months after the first, for a recurrence of itching. All of the patients seemed much gratified with the results obtained, so far as they were able to follow them.

An interesting change is to be noted in the physical appearance of the skin after a patient has received this treatment. The skin in typical cases of severe pruritus is thrown into thickened folds and ridges; it looks edematous and grayish-white, with red scratch-marks and superficial fissures radiating from the anus, and feels stiff and indurated. A few days after an alcohol injection the folds become less pronounced and rugged; the color becomes more that of normal "flesh-color," and the scratch-marks disappear. In short, there is a return to the normal appearance of the skin in this region.

The technique of injection is quite simple. The area in which the itching is complained of is carefully noted from the patient's description, and indeed is usually well marked out by the characteristic features just described. Under general or local anesthesia, the injection is then made so that this whole area is anesthetized. In nearly all the cases here reported, a local anesthetic, usually novocaine (1 per cent) or quinine and urea hydrochloride (1 per cent) has been employed. This form of anesthesia has proven quite satisfactory. The syringe is filled with alcohol (95 per cent) and the usual fine hypodermic needle used for the injection. The needle is carried entirely through the skin vertically, and then is inclined sharply through to the side so that it lies nearly parallel to the skin surface. When the needle is properly inserted in the subcutaneous fat, it can be moved fairly freely from side to side under the skin and can be felt moving with the finger placed over it. If this freedom of movement is lacking, the needle is probably engaged in the corium, and if injections are thus made, sloughs may

be expected to result. With the needle properly placed the whole area involved is injected, enough alcohol being used to underlay the area thoroughly. The injection may be carried up to the margin of the anus, but Stone has never injected the anal canal itself, nor has he so far had reason to believe that this would have improved the results. Of course, before any injection is made, the skin is cleaned up as for any other operative procedure.

This method accomplishes practically the same thing as the operative treatment for pruritus, and is indicated in those cases of great intensity in which the usual measures have failed. It has certain distinct advantages over the operative procedures. It is safer—there is no undermined skin with impaired circulation, with a potential dead space under it, in an area impossible to keep clean. It is quicker. It entails no dressings, stitches, or other postoperative annoyances to physician or patient, and no hospital expense. It is quite as likely to be enduringly satisfactory, and presents no greater possibilities of trouble.

A PRACTICAL METHOD OF MINIMIZING THE PAIN OF LABOR.

The *New Orleans Medical and Surgical Journal* for August, 1916, contains an article by KOSTMAYER on this subject. His treatment is as follows:

As soon as the pain of the first stage becomes definitely annoying, chloral is given in 10-grain dose and repeated in forty-five to sixty minutes, as indicated, as much as three doses being given, if necessary. When the character of the pain changes to the "bearing-down" of the second stage, morphine ⅛ grain is given by needle, as soon as this pain is severe enough to warrant it. It is rarely necessary to repeat the morphine, though this may safely be done after an hour or two. If labor is retarded in the least, or if in the judgment of the physician labor might safely be hastened, pituitrin is given by needle—say 4 or 5 minims—increasing the second dose, giving 1 Cc. at the third dose, if necessary. As the presenting part begins to dilate the vaginal orifice, ether is given by the open drop method at the beginning of each pain, and continued until the pain subsides.

This method is detailed with no idea of originality, but because it is a simple, safe, and practical means of minimizing the pains of childbirth. It is a big asset to Kostmayer in his obstetrical work, and has added interest and pleasure to the management of maternity cases, upon which he formerly looked with a feeling closely akin to dread.

DEATH AFTER NITROUS-OXIDE-OXYGEN AND LOCAL ANESTHESIA.

In the *British Medical Journal* of July 22, 1916, MCCARDIE states that in a somewhat large experience of nitrous oxide and oxygen anesthesia, with and without the addition of ether, he has never seen any other case like that which he here relates. The patient very nearly died during the operation, and succumbed two hours and a half later without recovering consciousness.

The anesthesia lasted thirty-five minutes, during the last fifteen of which hardly any gas was given but a good deal of air, and a large quantity of oxygen with rebreathing. There was no respiratory obstruction at any time.

Why did this man die? As a comparison McCardie might say that five days previously he had administered gas and oxygen by the same method to an old lady of seventy-two, who appeared to be in worse condition than he, for a severe gall-stone operation; the difference in the treatment was that she had before operation a trifle less morphine, which made her drowsy beforehand. The anesthesia and muscular relaxation were perfect, much less oxygen was necessary than in the case he relates, her color was pink throughout, and respiration and circulation were very good; there was no evidence of shock, although the administration lasted one and a half hours.

Points that occur to McCardie for consideration are:

1. That the circulation failed long before respiration.

2. The failure could not have been due to traumatic shock, because it began before incision.

3. The morphine could not be incriminated, because the patient had had as big or bigger doses before, and was not drowsy before operation.

4. There was no asphyxia from obstruction to respiration, and twice as much oxygen as is usually necessary was inhaled, while very little gas was given.

5. McCardie does not think that death was due to too much gas, because circulatory failure occurred very early, beginning with the administration of the gas.

6. The patient was physically a very curiously nervous man, and McCardie is inclined to think that psychic shock, together with anemia, causing heart weakness, were largely responsible for the fatality. This explanation, he admits, is hardly satisfactory.

7. Why did consciousness never return?

8. Would the early addition of a small quantity of ether to the gases have been of value?

ETIOLOGY OF UTERINE PROLAPSE.

FITZGIBBON (*Surgery, Gynecology and Obstetrics*, July, 1916) as a result of a study of this condition reaches the following conclusions:

Prolapse of the uterus and cystocele are due to damage of the pelvic fascia in the region of the lateral fornices and in front of the cervix.

Prolapse of the uterus must be clearly differentiated from cystocele; they may exist separately or be combined.

Laceration of the perineum and levator ani muscles has no part in the production of prolapse. It allows an increase of cystocele when there is the primary defect.

Retroversion of the uterus has no tendency to produce prolapse.

Prolapse of the uterus and cystocele are analogous to abdominal hernias through scars, due to defective union of the fascia.

The cure of the condition can be effected by reuniting the fascial diaphragm across the pelvis.

The fascial diaphragm can be repaired without interfering with the function of the uterus or dislocating the bladder.

The condition can be treated in exactly the same manner before and after the menopause.

Atrophy of the uterus has no influence upon its support.

Amputation of the cervix other than the removal of a hypertrophied lacerated vaginal portion is not necessary.

TREATMENT OF SYPHILIS IN THE ARMY.

MCGRIGOR (*The Practitioner*, May, 1916) records in the Connaught Hospital over 3000 admissions for syphilis and over a thousand for gonorrhea. There are many old cases declaring that they have been free from all symptoms while in civil life, but that the stress and strain of training causes them to break out again. All cases when diagnosed were treated in the hospital and kept therein until free from manifestations. The average stay in the hospital was a little over fifteen days. About 14 per cent had definite headaches, usually nocturnal. These stopped after the first injection of "606." The first injection of mercury was always given before the "606" injection. A small amount of albumin in the urine is not regarded as a contraindication to the use of arsenic. Some cases were given "606" when the urine was loaded with albumin. The proteid content rapidly disappeared, proving that it was of syphilitic origin. One complete course of treatment was given to all cases, after which the patient was considered fit for active service. One, two or three per cent of all cases treated needed to be readmitted for hospital treatment, the necessity being due in all cases to patches recurring in the mouth probably from excessive smoking, sore gums from too much mercury or neglect to keep the teeth clean. It has happened in one or two cases that the original primary lesion broke down once more after having healed up.

First, as to the preparation of the solution, ordinary tap-water was boiled; in 10

Cc. of this taken at 60° F. was dissolved the contents of the neosalvarsan bulb.

Writing on the same subject French notes that they have treated 60 cases of venereal lesions, syphilitic and non-syphilitic, by means of light, and are of the opinion that it is a great help in cutting short the stay of the patient in hospital. The average saving, in cases of Hunterian chancres and soft chancres, is seven days, and in the cases of deep suppurating buboes of the groin the treatment has diminished their stay in hospital by several weeks. It may be mentioned here that it is absolutely necessary for military patients to be thoroughly healed before they are sent back to any form of duty. The light is a powerful ultra-violet ray, which is allowed to impinge on the affected part from two to three minutes, three times weekly; the distance of the source of light being twelve inches from the patient. The patients so treated have no other external application to the parts, and healing in the majority of cases is very rapid. In phagedenic cases the results are most gratifying; the destruction is arrested, and a healthy, soft cicatrix is formed. A noticeable feature in these cases is the absence of pain after the first application. This loss of pain is of great benefit to the patient, for it is well known how very painful these ulcers are. If the duration of the treatment is limited to three minutes, no erythema of the skin is produced, but it is necessary for the patient to close his eyes, otherwise conjunctivitis will be brought about. The author has been using the Simpson light for the past nine months, and has not experienced any untoward effect.

Patients in whom the S. pallida has been demonstrated are given antisyphilitic remedies, such as salvarsan or galyl and mercury during the light treatment. The chancres of the patients who do not undergo the light are being treated with ung. rubrum (scarlet red), Parke, Davis & Company. This is one of the best of stimulating ointments, and is strongly recommended. Its use has proved very beneficial in cases of tertiary ulcers of the leg, and they have alternated this and the light treatment with success.

The author has been treating a series of cases of cerebral and spinal syphilis with intraspinal injections of mercurialized serum. This serum contains 1/50 of a grain hydrarg. perchlor. in 30 Cc. of sterilized horse serum. A puncture is made in the fifth interspace, and about 30 Cc. of spinal fluid is drawn off. A rubber tube, which is connected with the ampoule containing the mercurialized serum, is then attached to the needle, and the fluid is allowed to pass into the spinal canal slowly, the ampoule being held at a somewhat higher level than the needle. In all these cases they considered it advisable to give a ten days' course of potassium iodide and mercurial inunction before the intraspinal injection. This is done in order to absorb any round-celled infiltration producing endarteritis in the vessels. Three intraspinal injections are given for the course, one weekly. The after-effects are only those usual after lumbar puncture.

"TRENCH FOOT."

WALLER and RIDEAL (*Journal of the Royal Army Medical Corps,* May, 1916) present an article on this subject in which they state that "trench foot" may provisionally be defined as a condition due to prolonged action of water on the skin combined with circulatory disturbance due to cold and inaction.

Water is an abnormal environment for the skin. Theoretically, there are three actions of the water: (1) Loss of heat due to increase of conductivity and thermal capacity of the surrounding medium; (2) effusion of salts from the skin; (3) infusion of water into the skin. A normal skin can, of course, resist these actions, but when the exposure is prolonged and the circulation is diminished the osmotic action may become important. This is proved by experience and by experiments. Fishermen and otter-hunters find that after several hours' contact with cold water there may be some pain, tenderness, and even swelling of the feet, lasting perhaps a day or two. Workers in paper manufactories,

who have to stand for a day at a time in several inches of warm water and paper pulp, have similar symptoms. These are not entirely due to circulatory disturbance.

"Trench foot" is said to occur in cases in which water has been excluded. Experiments were made with various kinds of grease in order to find one which would be impermeable to sweat, and would thus prevent the accumulation of sweat in the sock.

For each ointment tested a control experiment was previously made on the naked hand. The average amount of sweat was three grammes per hour without ointment, and one and a half grammes per hour with ointment.

It is suggested that a salted ointment such as salted lard would be beneficial in protecting the foot against water. The salt would further act as an antiseptic. A liberal amount of ointment would be necessary—*e.g.*, 100 grammes for each leg, with five or ten per cent salt.

All other practical precautions should have been taken, such as foot inspection, so as to insure the men using the ointment, provision of dry socks with the waterproof trench boots, loosening of the puttees, etc.

Officers' spiral puttees contract five to six per cent of their length when they are soaked in water.

THE ETIOLOGY OF CANCER OF THE STOMACH.

LERCHE (*Surgery, Gynecology and Obstetrics*, July, 1916) in a paper on this subject concludes as follows:

Cancer of the esophagus and stomach is peculiarly prevalent among the inhabitants of the temperate climate zone.

The relative frequency with which cicatricial strictures from swallowed corrosive fluids occur in the various parts of the esophagus increases from above downward; in other words, the widest parts of the esophagus are the most frequent sites of such strictures—and for physiological reasons.

Any part of the esophagus and stomach may be the starting-point of cancer with the exception of the pyloric sphincter, which rarely seems to be the primary focus. The organ immediately beyond, namely, the duodenum, is practically immune from cancer. The reason for the latter two phenomena is probably that the ingesta do not reach the pyloric sphincter until they are properly modified.

In view of the foregoing conclusions, it seems logical to look to the ingesta of civilized man for the source of chronic irritation, which leads to malignant changes of the esophagus.

The supposition that swallowed fluids after emanating from the cardia are directed along the "gastric gullet" to the prepyloric region is strongly supported by the fact that the cicatrices from smaller quantities of swallowed corrosive fluids are usually found along this path.

Seventy-nine per cent of cancer of the stomach are also found along this path—the cardia, the "gastric gullet," and the prepyloric region.

As cancer of the stomach follows the "highway of the fluids," it seems logical to assume that ingested fluids in particular may be responsible.

Alcohol and other irritating fluids probably play a part, but in the opinion of the writer "hot fluids," so universally taken throughout the temperate climate zone in the form of coffee, tea, soup, etc., and giving rise to chronic irritation, is the main predisposing cause of cancer of the esophagus and stomach.

Cancer of the esophagus occurs less often in women than in men, because women drink more slowly and take smaller swallows, which pass quickly through, thus saving the esophagus, while the less resistant mucosa of the stomach, where the fluids come to a stop, is more equally exposed in both sexes.

The fact, therefore, that the ratio of cancer of the esophagus in men and women is 3.5 to 1, while cancer of the stomach occurs with almost equal frequency in both sexes, points strongly to "hot fluids" as the important predisposing cause.

This is further substantiated by the results of a comparison between the cancer statistics and the habits of the people in the north and south of Europe, by the relative freedom from cancer of the esophagus and stomach enjoyed by the aborigines of hot climates, and the extremely rare occurrence of cancer of the esophagus in animals.

PREVENTION OF VENEREAL DISEASES IN THE ARMY.

MAY (*The Practitioner*, May, 1916) noting that war is likely to bring in its train a large increase in venereal diseases, responsible, even in time of peace, for a heavy toll on the health and efficiency of the army, attributes this increase to the gathering of enormous numbers of young men into camps away from home influences and to the wave of emotionalism which sweeps away the self-restraint of so many girls and women, this being particularly noted in the early months of the war.

Moreover, to the troops doing garrison duty abroad wide facilities for infection were offered by licensed brothels, especially dangerous from the specious sense of security engendered by their municipal recognition. In spite of these adverse conditions the Royal Commission on Venereal Diseases in their final report state there is no reason to believe that the percentage of infection in the naval and military forces is now greater than in normal times; but there can be no doubt that the total number of infected persons has increased, thus resulting in an appreciable impairment of the army's efficiency.

The principal methods of prevention may be roughly classified as: (1) Educational; (2) diminution of opportunities for exposure to infection; (3) artificial prophylaxis.

Under the heading education is included a descriptive syllabus of gonorrhea and syphilis; the need of early and efficient treatment; insistence on prevention being guaranteed only by keeping out of the way of possible infection; denunciations of the idea that continence is ever harmful; elucidation of the importance of alcohol as a contributing factor; and the need of each man keeping in perfect condition from the point of view of efficiency in the army.

More than 750 lectures have been given to 500,000 troops, and they were well and even enthusiastically received. The education of girls and young women in these matters is an essential complement to that of the men. Several courses of lectures have been given to women social workers under the auspices of the National Council. These lectures deal with the problems of sex, motherhood, and disease, and the audiences consist of rescue workers, nurses, and members of various organizations, such as the Mothers' Union, the National Union of Women Workers, the Parents' National Educational Society, the National Organization of Girls' Clubs, the Y. W. C. A., etc.

These audienecs utilize the knowledge thus acquired to instruct the girls among whom they work. Provision for opportunities for recreation has been of the greatest use in lessening opportunities for exposure. The action of the Liquor Control Board in limiting the facilities for obtaining drink has also had a most beneficial effect.

There are two fairly distinct classes of dangerous women: (*a*) The professional prostitute; (*b*) those who indulge in promiscuous intercourse while following some other occupation for their livelihood. Since the outbreak of the war the latter class has increased considerably in number in the neighborhood of large camps. These girls are often ignorant of the dangers of their mode of life, and may spread disease without being actually aware of their having become infected. Further, the police are naturally diffident about interfering unless they encounter actual indecency, and the darkened condition of the streets and public open spaces afford ample opportunity for clandestine wrong-doing. Some useful work among this class has been done by "women patrols," organized by the National Union of Women Workers.

As regards actual prostitutes, the state of affairs is extremely unsatisfactory. No

organized effort has been made by local authorities, civil or military, to prevent their migration into large military centers. The Women's Police service, working under the joint authority of the Civil and Military Police, have been helpful in lessening this evil and have also been serviceable in protecting children and young girls from molestation.

As to artificial prophylaxis, the experience of the Austrian and German armies seems to show that the provision of various preventive measures diminishes, but by no means abolishes, the incidence of disease.

May proposes the establishment of camps or depots for preventive treatment under medical control, which the men should take as soon as possible after exposure. He expresses the belief that an irrigation of the anterior urethra with two or three pints of a 1:2000 permanganate at a pressure of about 4 feet is practically certain to prevent gonorrhea at any interval after exposure up to twenty-four hours. Calomel ointment 33 per cent seems to be efficient against syphilis. It is strongly advised that the utilization of such measures should be made compulsory by severely punishing all men found to be suffering who have not availed themselves of this treatment.

CAUSE AND PREVENTION OF TRENCH FEET.

HUGHES (*British Medical Journal*, May 20, 1916) describes cases occurring in men who were on duty in a wet sap, who had felt little inconvenience, excepting the feet had felt like pins and needles and had "gone to sleep." There was time and opportunity for one man at a time to sit down and get his feet up.

On coming off duty in the morning they were able to take their boots off, rub their feet, and turn into a dug-out. In some of the dug-outs they could lie at full length, in others they were semi-recumbent. During their sleep, despite the fact that their puttees were off, their socks changed, and boot laces slack, the feet swelled, became red and tender, and the circulation in them was sluggish. The edema was soft and pitted on pressure. On putting on their boots these men were unable to walk.

Hughes calls stage 1 that in which the exudation causing the edema in the foot takes place first of all deep in the plantar fascia and extends to the dorsum of the foot; for the same reason that an inflammatory exudation deep in the plantar or palmar fascia usually manifests itself in edema of the dorsal surfaces. The soles of the feet were very tender to deep pressure.

In stage 2, manifested by men who persevered in trying to do their duty in the trenches, reporting twenty-four hours after the first stage, the foot was swollen and cold and the condition sometimes, though rarely, extended to the ankle, though never above it. Pain was rarely a marked feature. The edema was of quite a different type, there was no pitting on pressure, and the feel imparted to the hand was that of a solid rubber ball. The circulation as tested peripherally was extremely sluggish.

Stage 3 was the last, in which gangrene supervened.

On improving rations and issuing rubber boots in an effort to keep the feet dry there was a distinct improvement. But many patients still reported in stage 1. They were sent to the hospital and returned in ten days, often to relapse.

Hughes in the course of his duties in the trenches finally stopped to rest on a fire-step with his legs hanging down. At the end of three minutes his feet had gone to sleep. There was the sensation of pins and needles, and the feet felt numbed. Thinking this might be a coincidence, he tried it on two successive occasions, only to find the same thing happened each time. After the third time he could not get his boots on. At the end of forty-eight hours' rubbing and elevation the pain had gone. He then established the rule that every man should rest with his feet up. This in combination with proper shelter and proper food abolished "trench feet." He believes two factors act in the predisposition to the

disease: First, fatigue, and second, venous stagnation and consequent exudation of material into the tissues of the foot.

The condition may be classed in three stages, as follows:

Stage 1, or the stage of congestion, brought about by resting, especially after any exertion or long standing, with the legs down. This is brought on more quickly if fatigue is in any way present, as after long standing while on sentry-go, when the lower extremity contains waste products of catabolism, so facilitating exudation from the capillaries into the connective tissue spaces. It will easily be seen how sitting on a fire-step, with the legs hanging down, would favor this, especially where there is some pressure exerted on the popliteal vein.

Stage 2, or the stage of coagulation. Here the exuded material appears to have undergone coagulation. This, again, would be hastened and favored by the presence of toxic catabolic products in the intercellular tissues. The feel of the foot in this condition, like to that of a solid india-rubber ball, coldness, and loss of sensation, marks some radical change between this stage and stage 1. Further, ordinary rubbing and massage seem to have but little influence on this condition, and electric vibratory massage combined with effleurage seem to be the only agents for removing the exuded material.

Stage 3, or the stage of gangrene, is brought about by the pressure of this exuded material on arteries and veins. There is thrombosis in the smaller venules, and such would be hastened by the presence of toxic catabolic substances present.

The whole plan of treatment aims at prevention. If once the condition has progressed to stage 2, then the case necessarily passes out of the hands of the regimental medical officer, and colleagues further down the line can better speak of the treatment of the condition than the writer. The same applies to cases that have progressed to stage 3.

What concerns those who are working in the front line is prevention and the treatment of stage 1, which is the stage of congestion.

Prevention is attained by insisting, whenever possible, that the men while resting should do so with their legs elevated. This cannot too strongly be impressed on officers commanding battalions, the second in command, and especially company and platoon officers. In addition to this, a nightly tour of the trenches, to convince oneself that such recommendations are being carried out, is essential. A daily tour is not necessary from this point of view, as most of the men are sleeping in their dug-outs in the recumbent posture.

One blanket per man should be insisted on, so that the sentry resting at night on the fire-step has two blankets to roll himself in and lie with his feet up on the step.

Hot soup and rum rations are, in the writer's opinion, valuable assets for the general vitality in trench life. Attention to this is all-important in warding off fatigue.

These points seem small and perhaps tending to "spoil the soldier," but in the author's experience they are thoroughly appreciated and call forth better spirit and better work, and have done much to ward off fatigue.

Rubbing of the feet does no harm and may do good, but the good comes from the fact that the men change their socks after doing it.

Hughes repeats that the main points in the prevention are:

1. Keep the feet raised whenever possible so as to prevent stagnation, especially after a period of standing while on sentry-go or in a listening sap.

2. Keep the soldier fit by getting the full calorific equivalent out of his ration, thus keeping the blood-pressure up and "warding off fatigue."

If congestion has occurred, he has always detained the men at the regimental aid post for twenty-four to thirty-six hours. If a regimental aid post has not existed in the part of the line to be held, he has immediately made one, and has always been supplied with a fatigue by the commanding officer to erect it in minimum time. This dug-out will usually accommodate six to eight men, and timely massage with rest

have rendered the men fit to go back to trenches in thirty-six hours. They report each day for three days for further massage, and at the end of this time, with instructions as to the keeping up of their legs whenever possible, the writer had no further trouble.

By this means many men were kept in the firing line who would otherwise have been temporarily lost to the unit, and this is a point the importance of which need not be emphasized.

TECHNIQUE OF SPLENECTOMY.

BALFOUR (*Surgery, Gynecology and Obstetrics*, June, 1916) explores the abdomen through a left Bevan incision. The suggestive frequency with which jaundice, attacks of epigastric pain simulating biliary colic, cirrhosis, and gall-stones occur in many of the diseases for which splenectomy is advocated, necessitates an accurate record of the condition of the liver, gall-bladder, and bile-passages. Such observations will ultimately possess specific value in the elucidation of the obscure but unquestioned intimate relationship between the spleen and the liver.

The dislocation of the spleen from its position against the diaphragm and the left kidney should be the first step in the actual removal of the organ. The separation of the diaphragmatic adhesions can usually be safely accomplished by the fingers. If it is found that the adhesions have acquired blood-vessels of sufficient size to require ligation, it is then even preferable, in most cases, to postpone such ligation (unless the vessels be reasonably accessible) until the spleen has been removed, the bleeding being temporarily controlled by a gauze pack described later. In an occasional case, however, adhesions cannot be stripped with safety, and they must be divided between long curved forceps, care being taken to engage only the adhesions in the clamps. Hartmann and others have advised that the operation be abandoned when these adhesions appear formidable. However, such conditions are not necessarily prohibitive to splenectomy, although in some cases absolute hemostasis has been secured with considerable effort.

Immediately on dislocation of the spleen, a long, hot abdominal pack is efficiently arranged in the space formerly occupied by the spleen until the entire area with which the organ has been in apposition is under firm pressure by the gauze. This accomplishes two purposes: First, and most important, the oozing surfaces are compressed, and, as the bleeding is usually venous, it is controlled without subsequent ligation, if the pack (a point emphasized by W. J. Mayo) is left undisturbed until the actual operation is completed. Second, an excellent support is provided for the safe manipulation and mobilization of the organ, the division of adhesions, and ligation of the main pedicle.

The spleen having been elevated in this manner, its further connections are the main splenic pedicle with its peritoneal investment (the lienorenal ligament), the gastrosplenic omentum, and in splenomegaly of long standing, various adventitious adhesions. The most satisfactory isolation and treatment of the splenic pedicle is obtained by the preliminary division of the accessory adhesions, as well as the peritoneal attachments and reflections. The gastrosplenic omentum should first be divided, in sections as close as possible to the spleen, between ligatures. The only named vessels encountered are the vasa brevia, which arise from the splenic artery at variable points, pass to the greater curvature of the stomach, in this peritoneal fold, and finally anastomose with the left gastroepiploic. In dealing with the upper edge of this gastrosplenic omentum, it must be remembered that here the fundus of the stomach is normally in very close apposition to the spleen. It is necessary, therefore, always to determine the exact relationship and protect the stomach from injury in its separation from the spleen. In an earlier experience the author accidentally included in a clamp and excised a small area of the wall of the

stomach, the resultant opening, however, being readily closed without postoperative complication. At the lower pole of the spleen there is an occasional fibrous attachment, derived from the phrenocolic ligament, which with the other adhesions should be separately ligated.

The spleen may now be further mobilized by careful dissection of the peritoneal and fibrous coverings of the splenic pedicle. The localization of the tail of the pancreas is the important feature of this mobilization, and as the relationship of the organ is not constant it is necessary to inspect it in all cases. In some instances the tail is short, lying against the renal surface of the spleen, on the posterior aspect of the pedicle, and it may be fitted so closely into the hilus of the spleen as to have acquired a concave edge. In other cases the tail is attenuated, it is in front of the splenic vessels, and in contact with the gastric surface, while often it does not extend into the operative field.

With the reflection of the lienophrenic ligament a better exposure is obtained of the tail of the pancreas; it can be detached from its original position by dissection and allowed to drop back from the hilus of the spleen.

Therefore, after such dissection the splenic pedicle consists, from a surgical standpoint, of the splenic artery and its veins. The artery in some instances has divided before reaching the hilus of the spleen, although it often continues as a single trunk well into the hilus, while the veins are always in two or more branches. The latter do not bear a fixed position as regards the arterial trunks, lying in front in some instances, and behind in others. They are distinctly larger than the artery itself, and their extreme friability must always be considered. The arrangement of the vessels of the pedicle is fan-shaped, the breadth varying in different cases.

At this point it is possible to decide whether it is best to treat the pedicle *en masse* or to ligate it in sections. The latter method is to be preferred, and the dissection of the pedicle is usually most advantageously carried out on its posterior aspect, with the spleen tracted toward the midline. The extent to which the spleen can be lifted out of the abdomen by careful traction is surprising if, following the division of the peritoneal and fibrous investments of the pedicle, certain of the lateral venous trunks are separately isolated and divided between ligatures. It should again be emphasized that caution must be exercised in the degree of traction to which the pedicle is subjected and in the dissection of these veins. It is chiefly because of the normal tortuosity of the splenic artery that this elongation of the pedicle is possible, thus facilitating its secure ligation. Where it is possible it is advisable to first secure the arterial supply, so that the spleen may partially empty itself of its contained blood through the unclamped veins before these are ligated.

If, on account of the arrangement of the veins and arterial branches, ligation in sections is not advisable, ligation *en masse* by the two-clamp method will prove a satisfactory and safe method. Two curved clamps are arranged on the pedicle with a third clamp on the splenic side to control "back bleeding," and the spleen is removed. A double strand of No. 2 plain catgut is tied with moderate tension in the crushed line of the inner clamp as a partial control, and a second strand is transfixed below the distal forceps as the actual control.

Having made certain, by either of these methods, that the pedicle is securely ligated, the large hemostatic pack is removed, the newly exposed surfaces inspected, any oozing points being separately secured by fine catgut on a needle, and absolute hemostasis assured.

The disease or condition for which splenectomy is done governs largely the technical difficulties and risk of the operation. In pernicious anemia the removal of the spleen can be accomplished with comparative ease and safety. Although enlargement of the organ has been present, adhesions are few and usually insignificant. The pedicle is as a rule small, and its treatment is not often complicated by the rela-

tionship of the pancreas. Furthermore, the risk of the operation in this disease can be minimized by intelligent preoperative treatment and observation, as well as by the careful selection of cases.

There must be a rational basis upon which splenectomy in pernicious anemia is advocated, as well as strict recognition of the limits of operative safety. Splenectomy is definitely contraindicated during an acute crisis, or in a period when the patient shows a steady decrease in hemoglobin and red blood-cells, or when mental torpor, cord changes, and edema mark the terminal stages of the disease. Repeated transfusions from a suitable donor will frequently carry the patient through most critical exacerbations of the disease, and the proper interpretation of the reaction following transfusion is essential. Further, it is important that a satisfactory donor be available after operation.

In splenic anemia, splenectomy is associated with a higher operative risk and greater technical difficulties than it is in any of the more common diseases of the spleen. In the cases seen by the author the spleen has been usually of large size, the vessels friable, and adhesions occasionally troublesome. Patients in the late stages of the diseases are prone to develop fever, ascites, cirrhotic liver, or severe anemia, which conditions contribute to the seriousness of the operation. The only instance in which the writer thought it inadvisable to attempt splenectomy was in splenic anemia with great ascites, atrophic cirrhosis, and aneurismal splenic vessels. The friability of the veins in this disease was especially demonstrated in a baby 22 months old, upon whom the author performed splenectomy for typical splenic anemia of the adult type.

The operation in hemolytic jaundice is of relatively little risk, and there has been no particular difficulty in the removal of the spleen, although the organ is occasionally very large. It is, however, most important to avoid splenectomy during an exacerbation of the symptoms. Of the cases the author has seen of this disease, the only operative death occurred in a patient in whom he failed to realize the import of a subacute and subsiding acholuric crisis.

In those cases of cirrhosis of the liver associated with splenomegaly, in which splenectomy is to be considered, the spleen is often firmly adherent, and this fact, together with the poor general condition of the patient, makes the operation rather hazardous. Nevertheless, in the cases selected for operation there has been no operative mortality; and in two cases most striking benefit has thus far followed the removal of the spleen.

In the rarer conditions, such as syphilitic spleen and idiopathic splenomegaly, the operation itself is not of great risk. It has been interesting to note the result of splenectomy in two cases of splenomegaly with specific history and positive Wassermann. In both of these it had been previously possible to obtain a negative Wassermann by salvarsan, but it would become positive on discontinuing the treatment. Since splenectomy the Wassermann has remained negative.

From the author's own experience he has found that the features to be emphasized in the technique of splenectomy are: (1) The abdominal exploration; (2) the dislocation of the spleen; (3) the use of a hot gauze pack; (4) the protection of stomach and pancreas from injury; (5) the preliminary ligation of adhesions; and (6) the treatment of the splenic pedicle.

DEAFNESS DUE TO SYPHILIS.

ROBERTS (*Journal of the Missouri State Medical Association*, April, 1916) discusses two forms of deafness: (1) Paracutic deafness; (2) nerve or labyrinthine deafness. He uses the term paracutic because it is descriptive of the symptomatology; the pathology has yet to be worked out.

Paracutic deafness is that form in which the patient is able to hear ordinary conversation best when in a noisy place; can carry on a conversation in the usual low tone on a street-car or in a noisy place and hear distinctly every word; but when in a quiet

room hears very poorly, or it may be necessary to shout to make him understand.

This form of deafness comes on gradually, is bilateral, and usually more pronounced in one ear than in the other. Some degree of this form of deafness includes at least 25 per cent of all people who are chronically deaf without a history of suppuration and between the ages of twenty and forty.

Beck, of Vienna, was the first to call attention to shortened bone conduction with a normal air as significant of lues. It was also determined that any disease which produced increased pressure in the posterior fossa of the brain gave the same bone conduction. Notwithstanding this it is a valuable test and an aid in diagnosis.

No one has called attention to a short air conduction with normal or increased bone conduction as significant of syphilis when accompanied by paracusis.

Mr. Heath, of London, has described the pathology rather indefinitely as a relaxation of the ear drum ossicular chain, middle-ear muscles, and membrane of the oval window. He gives as one of the main etiologic factors a too forcible blowing of the nose, causing great pressure through the Eustachian tube into the middle ear, producing a distention, relaxation, and eventually an atrophy of the drum and middle-ear structure.

Up to the present time he has submitted eleven cases to spinal-fluid tests for lues. Of these nine were reported positive to Wassermann and gold chloride; one positive to gold chloride, negative to Wasserman.

Paracutic deafness usually begins between the ages of fifteen and thirty, comes on gradually, and under former methods of treatment grows progressively worse. Patients usually do not complain of paracusis, and when questioned will say they had observed that they heard best in a noisy place, but had thought it due to the other person speaking more loudly, and only after a careful test for themselves were they convinced that they were paracutic.

They complain of a high-pitched tinnitus and autohypercusis; that is, they speak in a low tone and are hard to understand, their own conversational voice sounding very loud to themselves.

The family history usually shows that some other member of the family has impaired hearing, more often a brother or sister than a parent.

The physical findings are not very important. Inspection of drum in early cases shows nothing characteristic—in fact, the drums are very similar to the drums in chronic otitis media non-suppurative.

The etiology of this class of cases is syphilitic in from 80 to 85 per cent, and congenital in nearly all. For the other 15 or 20 per cent, if not syphilitic, it is difficult to give a cause, but certainly they are not catarrhal.

As to the pathology, it is probably a syphlitic periostitis or ostitis in the capsule of the labyrinth. When it begins near the oval window and produces a thickening and infiltration of periosteum there will necessarily result some degree of stapedial fixation. The process, of course, may progress and involve the cochlea, vestibule, and semicircular canals, their capsules and contents, and nerve deafness will result.

If the case comes under observation, is diagnosed and properly treated while bone conduction is still increased, he believes there is some chance for improvement in hearing. If, however, it has progressed to a stage of shortened bone conduction showing nerve degeneration, the prognosis is unqualifiedly bad for functional improvement.

THE TREATMENT OF RETROCECAL APPENDIX.

SHAW (*Annals of Surgery*, June, 1916) states that the difficulties encountered in the removal of a retrocecal appendix at times transform an otherwise simple operation into one almost formidable. The incidental trauma, possible injury to the great vessels and ureter, hemorrhage and deperitonealization, coupled with the danger of rupture to the appendix or its mesentery, etc., certainly call for oper-

ative measures more finished and more surgical than digging it out in the blind.

We have at our command a simple, clean, bloodless technique with which we can render the delivery of a retrocecal appendix a finished anatomicosurgical procedure—*i.e.*, the mobilization of the cecum and delivery of the appendix under sight.

The following summary shows the chief etiological factors in placing and retaining this type of appendix in its retrocecal position to be: First, the influence of peritoneal adhesions established during the descent of the cecum from its subhepatic position to the iliac fossa. Second, the inherent curve of the fetal pouch. Third, the unequal development of the pouch.

The appendix may be found in any part of the abdomen; this is due to numerous etiological factors, more especially to conditions of arrested development of the colon. However, in this brief paper the author states he does not wish to confuse the issue by the injection into the subject of any of the multifold varieties of aberrant appendices, except the retrocecal, and then only to that type of retrocecal appendix associated with a cecum whose descent is more or less complete, or at least in a subhepatic position. However, with a careful consideration of the relational anatomy, the suggested technique may be applied in principle to any case.

When retrocecal, the appendix must of necessity lie to the right of (external) or, in rare cases, beneath (posterior) the mesocolon; this point is of great importance when we come to consider the blood supply and the factors in delivery which are productive of hemorrhage.

The appendix may be primarily adherent to either the parietal peritoneum or to the posterior visceral peritoneum of the cecum and colon, and, after fusion of the parietal and visceral peritoneum occurs, it becomes hermetically sealed. Where fusion has not taken place (26 per cent of cases) simple manual rotation of the colon inward will reveal the appendix adherent to the visceral peritoneum of the cecum, and by incising the peritoneum external and lateral to the antimesenteric border of the appendix to avoid severing vessels of the mesoappendix, it will usually free easily from its visceral attachments by dry gauze dissection from without inward.

In that rare type of cases in which the colon has not fused, the retrocecal appendix is rare and, if it occurs, is generally adherent to the colon and not the posterior parietes primarily. However, a chronic appendix held in this position usually adheres more or less in time, simulating developmental fusion.

It would seem apropos to the writer to digress sufficiently at this point to suggest the diagnostic points necessary to determine the position of an aberrant appendix—*i.e.*, (*a*) careful survey of the cecum (with the embryology thereof in mind), (*b*) noting the relative size and position of the terminal sacculi, (*c*) its topographical peritoneal relations, (*d*) the degree of descent, (*e*) its position relative to fixed landmarks, (*f*) associated conditions both pathological and developmental, (*g*) the direction of the terminal portion of the longitudinal bands, and (*h*) careful palpation. These are all factors of primary importance in determining the position of the appendix. (Especially practical is the pointer in reference to the direction of the longitudinal bands.)

By keeping in mind the etiological factors in arresting and maintaining *in situ* the retrocecal appendix, how elementary it would seem to simply reverse the order of their occurrence (*i.e.*, first, adhesion; second, fusion), and, first, mobilize the cecum and portion of the colon necessary for exposure, then, secondly, under sight separate adhesions and deliver the appendix.

The mobilization of the colon is a simple, clean, bloodless, and accepted surgical procedure.

The delivery of the retrocecal appendix in this manner has proven simple and logical. This method is mentioned by Vosburg and possibly by others, but he does not claim it as original. However, this much is sure, that the procedure is by no means common, generally understood, or

adopted, and at the expense of reiteration the writer wishes to adduce his personal approval, believing that the delivery of a retrocecal appendix by mobilization of the cecum (and colon when necessary) is certainly a distinct step in advance over the dangerous unsurgical technique of digging them out in the blind, and will certainly bear repetition and reëmphasize a most important procedure.

Believing the subject of developmental anatomy of the gastrointestinal canal and the accepted and conventional facts in regard to varieties and etiology of aberrant appendices are not proper subjects for review in current literature, the author has endeavored to encroach upon the time of the reader only sufficiently to state certain basic truths, just enough to establish a rationale for the procedure advocated.

PREGNANCY IN THE TUBERCULOUS.

NORRIS (*American Journal of Obstetrics and Diseases of Women and Children*, June, 1916) concludes an excellent article on this subject as follows:

The combination of pregnancy and pulmonary tuberculosis is a common one.

Pulmonary tuberculosis exerts little or no influence against conception.

Pulmonary tuberculosis exerts but little influence on the course of pregnancy, and except in the advanced stages exerts little or no influence toward causing abortion, miscarriage, or premature labor.

About 20 per cent of mild quiescent pulmonary tuberculosis and 70 per cent of more advanced cases exhibit exacerbations during pregnancy or the puerperium.

Marriage is worse for the tuberculous woman than for the tuberculous man owing to the dangers incident to pregnancy.

Unless the pulmonary lesions have been quiescent for a moderately long period, tuberculous women should not marry.

Tuberculous women should not become pregnant unless the disease is in the first stage, and has been quiescent for a minimum period of two years.

It is as yet impossible to determine with certainty which case will bear the added strain of pregnancy well and which badly. We must individualize our patients. Moderately extensive lesions, recent activity, the development of secondary lesions, especially laryngeal involvement, loss of weight, fever, hemorrhage, sweats, lack of vigor, inability to obtain proper treatment, are ill omens, whereas the reverse are more favorable.

Prior to the fifth month of pregnancy, the uterus should be emptied if the disease manifests any evidence of becoming active. Curettage during the first six or eight weeks, and in the later cases vaginal hysterectomy, are the preferable methods. Interruption of pregnancy does not insure an amelioration of the pulmonary condition, but does greatly improve the prognosis. About 65 to 70 per cent of cases, prior to the fifth month of pregnancy, will be definitely improved by emptying of the uterus as soon as acute symptoms arise, provided that proper after-treatment is carried out. Late intervention, that is, after a week or more from the onset of the exacerbation, has given less satisfactory results. Sterilization is rarely justifiable.

After the fifth month of pregnancy, it is generally advisable to treat these patients expectantly. Labor should be made as easy as possible. For this end, induction of premature labor two weeks before term is often advisable; rarely, if ever, should they be allowed to go beyond term. At labor forceps or version is usually indicated.

Infants should not nurse tuberculous mothers, and should be especially guarded from infection.

Hygienic and dietary treatment should be employed at all times. These patients should be kept under close observation, and should be examined by a competent internist at regular and frequent intervals.

In the great majority of cases the tuberculosis precedes the pregnancy. Even in those cases in which the symptoms are first observed during pregnancy, infection has generally occurred prior to conception, and an exacerbation during pregnancy has directed attention to the pulmonary condition.

PERFORATING AND PENETRATING WOUNDS OF THE CHEST WITH SEVERE HEMORRHAGE.

Don (*British Medical Journal*, June 10, 1916) advises prompt treatment of chest wounds accompanied by marked and persistent bleeding. He makes a stab through an intercostal and slips the outer covering of a tracheotomy tube along the blade of the knife into the pleural cavity. Air enters and blood is coughed out. The tube is turned so that the inner end points up and is fixed by straps. The treatment has for its principle the production of a hemothorax, supplemented by drainage of the clot, which in military practice practically always becomes infected.

The advantages of this treatment are that the lung collapses quickly and any wound in it immediately closes.

The lung gets complete rest for a time and will be better able to combat infection later, as it will contain very little blood effused into its tissues.

The suction force of respiration is immediately removed from the rents of the intrathoracic vessels, and clotting and natural arrest is allowed to take place.

Plugging may be done for hemorrhage from the chest wall with a certainty of arresting it and of doing no harm, and there will be less movement—a comparative rest—on the collapsed side.

TENDON TRANSPLANTATION.

Mayer (*Surgery, Gynecology and Obstetrics*, March, 1916) notes that a physiological tendon operation must conform not only with the general surgical principles of absolute asepsis, minimal hemorrhage, and minimal traumatism, but also with the following demands:

It must wherever possible restore the normal relationship between the tendon and the sheath.

The course of the tendon from its original site to that of the paralyzed tendon must run through tissue adapted to the gliding of the tendon. Injury to the periosteum or the crude boring of a hole through fascia or interosseous membrane is inconsistent with this demand.

The normal insertion of the tendon must be imitated wherever possible by implanting the living transplanted tendon directly into bone or cartilage, preferably at the insertion of the paralyzed tendon.

The normal tension of the transplanted tendon must be reëstablished and the physiological length of the transplanted muscle thus maintained.

The line of traction of the transplanted tendon must be such as to enable it effectively to do the work of the paralyzed tendon.

As an example of technique he describes an operation indicated only in cases of comparatively slight paralytic valgus, since the extensor proprius hallucis, even on the assumption of its functional hypertrophy subsequent to the operation, is not strong enough to replace the tibialis anticus.

The first skin incision, 4 cm. long, bowed with the convexity toward the sole of the feet, is made over the insertion of the tibialis anticus.

The tendon of the tibialis anticus at its insertion is slit longitudinally for 3 to 4 cm., and the bone or cartilage of the internal cuneiform is grooved for the reception of the extensor tendon.

The incision over the extensor proprius hallucis tendon runs in the line of the tendon from a point 3 cm. above the tip of the internal malleolus to the middle of the first metatarsal bone. The reason for this long incision is evident, when the sheath of the tendon has been opened; then it is seen that the mesotendon attaching the tendon to the floor of the sheath is too well developed to allow withdrawing the tendon from the sheath through a small supramalleolar incision.

It is well, however, not to expose the tendon unnecessarily at this stage of the operation, but to leave it *in situ*, until all has been made ready for transferring it into the sheath of the tibialis anticus.

This transfer requires an accurate knowledge of the fascial relations between the two tendons. A diagrammatic cross-

section through the calf about 5 cm. above the tip of the malleolus shows the three anterior muscles of the calf lying within the same fascial compartment. A cross-section three centimeters distal to the first shows the extensor proprius hallucis and the tibialis anticus divided from one another by a fascial septum derived from the fascia cruris. To run the extensor hallucis through this fascial septum would not be physiological. On the other hand, freeing the extensor hallucis to the level of the first cross-section, where both muscles lie within the same fascial compartment, would involve sacrificing many muscle fibers and important blood-vessels, since the origin of the extensor hallucis extends downward almost to the level of the malleoli. Fortunately, nature has indicated a suitable path. At one point, usually about 2 cm. above the malleolus, the septum separating the tendons is so thin as to be transparent. This is the site of election. Here the operator can draw the extensor tendon into the sheath of the tibialis anticus, confident in the knowledge that serious postoperative adhesions will not result. Since this point lies slightly above the upper pole of the extensor hallucis sheath, the fascia over the extensor must be incised for 2 to 3 cm. proximal to the sheath. The mesial fascial edge is grasped with the clamp and raised until the operator sees this thin portion of the septum. Here a small incision is made directly into the tibialis sheath. An eye-probe is passed through this incision in the line of the tibialis tendon, made to puncture the lower end of the sheath, and to appear over the insertion of the tendon.

The sheath of the extensor hallucis tendon is then slit open its entire length. The tendon is divided near the middle of the metatarsal bone, its end grasped with the tendon clamp, and the mesotendon divided close to the tendon until the operator reaches the lowermost muscle fibers. The vessels of the mesotendon are thus sacrificed, but a large vessel which runs through the lowermost muscle fibers can always be spared. The tendon end is threaded with chromic catgut by the stitch, the free ends of the suture are passed into the eye of the probe and the tendon thus readily drawn through the sheath of the tibialis anticus.

Withdrawing the tibialis anticus tendon from the sheath as first advocated by Biesalski produces needless trauma and is unnecessary, since the sheath does not closely invest the tendon, but is large enough to accommodate two tendons.

Fixation of the tendon. Here the knowledge of the laws of tendon tension is important, since otherwise the operator is likely to sew the tendon under too great tension and thus throw an unnecessary burden on the transplanted muscle. When the muscle is relaxed under narcosis and its origin and insertion are approximated, the tendon itself, as well as the muscle fibers, have a zero tension. Therefore, to give the transplanted tendon the exact physiological tension, one must merely approximate the origin of the muscle and its new point of insertion (in this instance, by holding the foot supinated and flexed dorsally), draw the tendon downward until it runs in a straight line, and suture it under just sufficient tension to maintain this desired course. With a little experience the operator knows beforehand just how long the tendon must be to reach its new point of insertion, and the chromic gut suture, inserted to draw the tendon through the sheath, can thus be used as the fixation suture.

The implantation site has already been prepared by slitting the tibialis tendon lengthwise and traumatizing the periosteum of the internal cuneiform. The tendon, threaded by the fixation suture, is now fastened securely between the two halves of the tibialis tendon. The sutures are threaded on a stout cervix needle or an instrument resembling a shoemaker's awl, and are passed through bone or cartilage, ligament, and fascia. The fixation must be mechanically fast. When properly executed it can withstand a traction of 20 to 30 pounds.

This mechanical fixation does not, however, meet the physiological demand, for firm though the suture is at the time of

operation experimental work has shown that such a suture produces a necrosis of the tendon, and therefore there is a possibility that subsequently the tendon may slip from its moorings. This slipping, however, is prevented by suturing the paralyzed tibialis tendon over the extensor hallucis. In this way the living tendon cells of the extensor proprius hallucis above the fixation suture are brought into direct contact with the periosteum and with the tendon of the tibialis anticus. Thus the fixation is rendered physiological as well as mechanical, for in the healing process, even though the tendon distal to the fixation suture necroses, an intimate union above this point is bound to occur between the tendon and the traumatized periosteum.

The distal stump of the extensor tendon is fastened to the adjacent tendon of the extensor longus digitorum, the fascia is closed, and thus the normal ligaments of the foot are restored. The skin incisions are closed without drainage.

GUNSHOT WOUNDS AND INJURIES OF THE SPINAL CORD.

COLLIER (*Lancet*, April 1, 1916) observes that in nearly all the cases the initial clinical picture is that of a total lesion of the cord. The early reappearance of the plantar reflex, if lost at first, and the change from the flexor to the extensor type soon after the seventh day, or the presence of an extensor response earlier than this, are certain indications that the lesion is partial and that some recovery will occur. Persistent loss of the plantar reflex and long-lasting flexor response are indications that the lesion is severe and that useful recovery is highly improbable. Early return of the knee-jerk and of the ankle-jerk is of good prognostic import. Even in the less severe cases the knee- and ankle-jerks do not return before the fourth day, and their reappearance before this date gives hope that complete recovery may occur. Colonel Gordon Holmes is of opinion that the presence of an extensor response is a certain indication that the lesion is incomplete. These remarks apply to each leg individually. The condition of the reflexes on one side has no bearing on the recovery of the opposition limb. The further prognostic indications are simple. They depend upon the date of return and the rapidity of return of sphincter control, of sensibility, and of motor power. Early return of sphincter control is one of the best of signs. In two cases in which recovery has been complete, and in two other cases in which recovery has been nearly complete, some sphincter control returned within a week of the injury.

SURGICAL TREATMENT OF ACUTE EPIDIDYMITIS.

MCKENNA (*Urologic and Cutaneous Review*, June, 1916) observes that in acute epididymitis we find the beginning of a hydrocele in the fluid around the testicle, and consequently the fascia investment of this gland under great tension. Hence simple division of this fascia will often greatly relieve pain. The question always arises as to whether the patient is more likely to be made impotent by opening the epididymis than by allowing the inflammation to run its course. The epididymis is described as a canal or tube, made up of transverse chambers. When the epididymis is acutely inflamed, the tube stands out so clearly that McKenna believes the operator can easily puncture the posterior wall of the affected chamber without doing any injury to the small tubules coming off from the testicle.

In operating upon a number of cases for short circuit of the vas deferens, the lowest part of the epididymis showed the seminiferous tubules to be closed, and this part of the epididymis to be a hollow tube without any spermatozoa; on further examination the tubules coming from the testes were seen to be blocked. This, of course, was due to the infection at the time of the acute condition not being relieved by operation.

Since this is the result, it would seem that the patient would be less apt to be

sterile if the pus were drained off before stenosis could take place. Many patients who suffer with acute epididymitis, and are treated in a palliative manner, afterward are capable of passing living spermatozoa. This, of course, is due to the lessened amount of inflammation in the epididymis and the amount of free pus in the vas, which is absorbed by nature at the time of the infection. The only good reason for operating in this class of cases is incident to the excruciating pain that they suffer at the time. The intensity of pain is indicative of the amount of pus in the epididymis and the amount of inflammation surrounding the testicle.

Eleven cases were treated in different ways for the relief of pain—the first four by cutting down on the epididymis and putting a gutta-percha drain in the lumen, an operation obviously requiring a manipulative deftness beyond the reach of the ordinary surgeon. These four cases were greatly relieved of pain, but it was from fourteen to twenty-one days before the entire swelling was relieved. In four cases the epididymis was exposed by careful dissection and the different fascias divided one from the other and the epididymis drained. In these cases the patients were entirely free from pain, and the wound healed and the swelling disappeared within eight days. In two cases the dissection was made complete and the fascias separated from each other, and the epididymis was not punctured for two days. Both cases had immediate relief from the general pain, but complained of a sharp toothache-like pain in the testes. In the last case the incision was made on the opposite side, allowing the free fluid to escape from the tunica vaginalis. In this case the patient was greatly relieved of pain, but not entirely so. Two days later with a local anesthetic the epididymis was opened and drained and the patient entirely relieved of pain.

A blind stab operation is not to be recommended, because it is quite difficult to do this operation and be sure to separate the posterior wall of the epididymis without plunging the knife into the tubules coming off from the testicle on the opposite side.

Surgical procedure is only necessary when the patient is suffering excruciating pain.

When this procedure is carried out, it is quite necessary to divide the fascias so as to free the tension from the testicle as well as the epididymis. Patients are less apt to be impotent if the posterior wall is divided carefully and the pus drained off than if it is left to nature to absorb.

It is not necessary to split the entire epididymis, but only the infected chamber, which stands out clearly.

REVIEWS.

SYPHILIS AND THE NERVOUS SYSTEM. For Practitioners, Neurologists, and Syhilologists. By Dr. Max Nonne. Authorized Translation by Charles R. Ball, M.D. Illustrated. Second Revised American Edition. J B. Lippincott Company, Philadelphia, 1916. Price $4.00.

There was no field in therapeutics twenty years ago about which so little was known and in which so little could be accomplished as the field of diseases of the nervous system. It is true that occasionally remarkable effects were produced in cases of gumma of the nervous system, and in certain other lesions arising from syphilis, by the administration of the various mercurials or iodides, but, nevertheless, the physician who found himself face to face with definite manifestations of syphilitic disease of the nervous system had to admit that the proposition before him was difficult and the prognosis unfavorable. The rapid advances which have been made since then in our knowledge of the parasite which causes syphilis, and of its existence in the perivascular spaces many years after the primary lesion has taken place, have done much to clarify our conception of the changes which are present, and the various tests which have been made to determine that the syphilitic virus is still active render the diagnosis certain where before it was

uncertain, and so permit much more direct treatment, which has further been amplified by the introduction of the newer arsenical compounds and by the employment of so-called salvarsanized serum.

The appearance of the third German edition of Nonne's work in the form of a second edition of the American translation is, therefore, most timely, because this subject is one in which we need a complete summing up of our present knowledge and also because the general practitioner is possibly quite as frequently called upon to treat nervous syphilis as is the neurologist. Not infrequently the general practitioner is so much at a loss as to diagnosis and treatment that he refers his patient to the neurologist, and afterwards finds that with a little more knowledge, which he could gain from a book such as this, he could have made a satisfactory diagnosis, both from the standpoint of the consulting room and the laboratory, and have applied proper measures for relief.

In the present volume the most notable changes from previous editions naturally consist in the chapters on Paresis, Tabes, and Serobiological Reactions, and Therapy.

After a preliminary consideration of our knowledge of syphilis of the nervous system and of the prevalence of this disease, as well as a discussion of the specific organism and the methods of infection, Nonne proceeds to a consideration of the pathological changes induced by the spirochete, both in the nervous tissues and their supplying blood-vessels with the symptoms which are commonly or uncommonly manifested as a result of the invasion. He then discusses Syphilis, Cerebrospinal Meningitis, and every other aspect of nervous syphilis, with a chapter upon Specific Basilar Meningitis, as well as a chapter upon the Symptomatology of Syphilis of the Base of the Brain, the Neuroses and Psychoses of Syphilitics, Syphilis of the Spinal Cord and its Membranes, and then takes up Syphilitic Diseases of the Peripheral Nerves and Hereditary Syphilis Affecting the Nervous System, followed by a chapter Concerning the Behavior of the Wassermann Reaction in the Blood and Spinal Fluid, including the Globulin Test, Luetin Reaction, and cognate subjects. The eighteenth chapter deals with The Prophylaxis of Nervous Syphilis; and the last, or nineteenth, chapter with Salvarsan Therapy: Concerning its Methods of Administration, its Effects in General and on Definite Lesions, with a discussion of the Administration of Mercury with Salvarsan.

The type used is large, well spaced, and, therefore, the text is easily read. As we have already pointed out, the volume is a notable contribution to modern medical literature, and the translator deserves much praise for the skilful way in which he has carried out his work and for placing in the hands of his medical confrères so excellent a summary of a useful German text.

THE TREATMENT OF DIABETES MELLITUS. By Elliott P. Joslin, M.D. Lea & Febiger, Philadelphia, 1916. Price $4.50.

There is probably no one in this country whose name is more closely and more favorably associated with the investigation of this extraordinarily complex malady than Dr. Joslin, whose contributions to its investigation are universally recognized as of the greatest possible value and whose opportunities for research have been admirable. The present book is based upon 400 fatal cases and 600 patients who are still living. The author makes the encouraging statement that while three years ago he would not have wished to write a book upon this subject, to-day it is a pleasure and an inspiration because the improvement in treatment is beyond question, which practically means that he indorses to a large extent the employment of fasting and exercise in the treatment of diabetes, as suggested by Dr. Allen. Dr. Joslin states that the mortality of his patients has been diminished twenty per cent during the year by the application of this plan. More encouraging still is his statement that the so-called acutely fatal diabetes is disappearing under modern methods. Dr. Joslin also gives us the interesting statement that he believes that there are more than five hundred thou-

sand individuals with diabetes in the United States. It is also important to note that he recognizes the difficulties which exist in carrying out a prolonged plan of treatment by any patient, and particularly by diabetic patients. In other words, both the practitioner and the patient must clearly understand the reasons for a Spartan life.

We have already called attention in the GAZETTE to the fact that while Dr. Allen's treatment is applicable in a large majority of cases it is not applicable in all, and Dr. Joslin has recently published papers which show that, like every other therapeutic measure, the so-called starvation plan is not universally applicable in rigid detail to all cases.

As the book covers nearly four hundred and fifty pages it may be considered an exhaustive consideration of a very important subject, in which the author not only presents his own views and results but also those of other workers who are generally recognized as being worthy of emulation. Aside from giving excellent descriptions and tests it also provides much information which the practitioner can immediately and readily apply to patients who may be under his care suffering from this so-called disease.

THE PROBLEMS OF PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY OF METABOLISM. By Dr. Otto Von Fürth. Authorized Translation by Allen J. Smith, M.D. J. B. Lippincott Company, Philadelphia, 1916. Price $6.00.

As may be gathered from the title of this book it deals by no means with simple problems in physiology, but with some of the most complex problems with which modern physiologists and physiological chemists have to deal. It contains twenty-five chapters. After an Introduction to the Study of Metabolism and Protein Digestion in the Stomach, it considers The Proteolytic Pancreatic Ferment, Protein-Digestion in the Intestine, Proteolytic and Peptolytic Tissue Ferments, The Excretion of Aminoacids, The Physiology of Purin Metabolism and Its Pathology, Digestion and Assimilation of Carbohydrates, The Various Types of Diabetes, Natural and Induced, The Relationship of the Glands of Internal Secretion to Carbohydrate Metabolism, Sugar Destruction in the Economy, The Digestion and Resorption of Fats, Fat Splitting Tissue Ferments, Acetone Bodies, Nutritional Requirements, The Technique of the Study of Gas Exchange, Oxidation Ferments, The Coloring Matter of the Blood, Blood Gases, and last of all the Metabolic Conditions which Exist in Connection with Fever. Altogether the book covers nearly seven hundred pages, but the type and leading is unusually large, so that it is not so great a mass of text as the number of pages would indicate. Almost every page contains multiple references as foot-notes. This book will prove useful, in the form of its translation, to English-speaking physiologists and physiological chemists, and among these it will doubtless attract much attention. There is much in it that will interest the general medical man, particularly if he has leanings to the laboratory. The text is, however, too technical to attract the busy practitioner, who will be content to rely upon his text-book of physiology for the meagre information which he thinks he needs along these lines, but who, if he wishes to gather any information over and above that found in the ordinary physiological text-book, will be glad to refer to this perfect mine of information concerning comparatively recent, but nevertheless most fruitful, fields of investigation.

A TEXT-BOOK OF PATHOLOGY. By William G. MacCallum, M.D. Copiously Illustrated. W. B. Saunders Company, Philadelphia, 1916. Price $7.50.

This book, which is fully as large if not larger than the work upon Pathology written by Delafield and Prudden, is an able presentation of one of the important departments of medicine, not only for the medical student but for the practitioner. The latter is too much inclined, after he leaves his medical school, to ignore the fundamental branches of medicine, with the result that his conceptions of disease become impaired.

So many advances have been made in our knowledge of pathology or morbid physi-

ology that the graduate of a decade ago, as well as the graduate of two or three decades ago, is generally much behind the times in his conception of the conditions which exist in a given patient, and this book, which is a most scholarly presentation of what can be made an uninteresting subject by an unskilful writer, is to be welcomed not only for its own worth, but because its attractiveness will increase knowledge concerning the subject with which it deals. A sufficiently large bibliography is appended to each chapter to enable the reader to look up the original articles, if he so desires, and the text and illustrations are of such a nature as to make the book useful, not only for study but also for employment in the post-mortem room in the determination of the character of lesions which may be found. The book is handsomely printed and the illustrations are praiseworthy.

THE AMERICAN YEAR-BOOK OF ANESTHESIA AND ANALGESIA FOR 1915. Edited by F. H. McMechan, A.M., M.D. The Surgery Publishing Company, New York, 1916. Price $4.00.

The intention of this large volume of over four hundred pages, printed in double columns, is to present, to those who are interested in these subjects, the summarization of many, if not all, of the important papers which have appeared recently in regard to the effects of anesthetics and analgesics upon animals and man. It is freely illustrated, wherever the necessity for illustrations occurs, and handsomely printed upon heavy paper. It is the intention of the editor to publish subsequent volumes, or yearbooks, dealing with these subjects, thereby providing the profession with a large amount of information along these lines in concrete form. The papers, representing articles which have appeared elsewhere, deal with a number of very interesting subjects, as, for example, The Blood Changes Under Anesthesia and Analgesia; The Peripheral Origin of Shock; Posture in and Depth of Anesthesia; A Study of the Blood-Pressure Under Anesthesia from Records of Six Thousand Cases; Cardiac Fibrillation and Chloroform Syncope; Kidney Function and Anesthesia; The Nasal Administration of Nitrous Oxide-Oxygen; and a number of papers upon Local Anesthesia for General and Special Surgery. There is also an interesting paper upon Spinal Anesthesia in Genito-urinary Surgery; in addition to quite a number of others, as, for example, one upon Alkaloidal Amnesia in Obstetrics.

THE NATIONAL FORMULARY. Fourth Edition. Prepared by the Committee on National Formulary of the American Pharmaceutical Association. The American Pharmaceutical Association, 1916.

The National Formulary is designed to provide the physician and pharmacist with formulæ or prescriptions which have been proved to be therapeutically efficient, pharmaceutically elegant, and devoid of any chemical incompatibility. An energetic and thoroughly equipped committee of the American Pharmaceutical Association has prepared a book which in its previous editions has been much used by druggists and too little by physicians, who, as a rule, do not make themselves sufficiently familiar with pharmacy to enable them to write excellent prescriptions. The main part of the book, however, consists in describing drugs which have been in previous editions of the Pharmacopœia, or which are very commonly employed, although they have not been deemed worthy of inclusion in that legal compilation. The mere fact that they are not so included, however, does not prevent physicians from employing them and necessitates their preparation by the pharmacist when a prescription is written which calls for their dispensing.

The new National Formulary is an excellent companion volume to the new U. S. Pharmacopœia.

A MANUAL OF PRACTICAL LABORATORY DIAGNOSIS. By Lewis Webb Hill, M.D. W. M. Leonard, Boston, 1916.

This is a small handbook of less than two hundred pages in which the author has endeavored to bring together all the laboratory tests which he considers worth while and that the practical medical man needs, expressing them in such brief and compact

form that they can be readily carried out in the laboratory of the well-equipped physician. Various chapters deal with The Urine, The Blood, The Feces, The Gastric Contents, The Spinal Fluids, Pleural and Peritoneal Fluids, and Sputum. There are also a number of tests in Chapter 8 dealing with the stain for the gonococcus, the microorganism of syphilis, a description of the Schick test and Von Pirquet test, gram-positive and gram-negative organisms, and leucocytosis in various diseases. Every alternate page is a blank for notes by the operator, and, therefore, the text in reality only covers half the number of leaves which the book contains.

The idea of the author is an excellent one. Too many medical men are prevented from using the tests of clinical medicine by the feeling that they must employ a large and exhaustive manual which it is difficult to comprehend, if they are busy practitioners with little time left for laboratory investigation. This is unfortunate, since not infrequently diagnosis and treatment cannot be successful unless the physician calls to his aid laboratory methods, as well as those of ordinary observation and physical diagnosis. We therefore take much pleasure in calling attention to this excellent little contribution to medical literature.

PHYSICS AND CHEMISTRY FOR NURSES. By Amy Elizabeth Pope. Illustrated. G. P. Putnam's Sons, New York and London, 1916. Price $1.75.

The authoress of this book is already responsible for a number of other volumes intended for the use of nurses, including one upon Nursing in General, Anatomy and Physiology for Nurses, A Medical Dictionary for Nurses, and Essentials of Dietetics. Altogether there are 24 chapters in which nurses are given information along the line described on the title-page. Much of this information we believe is too technical for the needs of the average nurse, but the tendency at the present time seems to be to train the nurse to be rather a laboratory assistant than a bedside worker, which we believe is a mistake. This mistake exists also to some extent in medical education, but in the case of the nurse it is of infinitely greater importance that she should know how to take care of a patient, and that her training should be devoted to minute details in connection with such care than that many hours should be taken up through her course with matters which can only be of very little use to her when she is brought in actual contact with some one who is ill. In those training schools for nurses in which advanced courses of the kind which we have described are considered advisable this book will prove useful and popular.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Original Articles. Edited by H. R. M. Landis, M.D. Volume 2, 1916. J. B. Lippincott Company.

Under the able editorial management of Dr. Landis the present issue of International Clinics contains much that is of interest to the general practitioner, as well as the specialist. Opening with four articles of a therapeutic nature and with seven articles dealing with general medicine, it follows with two upon psychiatry, two upon obstetrics, three upon public health, and six upon surgical subjects. We note with interest that the editor, whose name has heretofore been associated with clinical medicine and therapeutics, is the leading contributor in the article entitled "Pre- and Post-Natal Work" under the heading of Obstetrics, all of which goes to show his versatility. The article by Dr. Beardsley upon Venesection, which opens the volume, is a good plea for this too little resorted to therapeutic measure.

A MANUAL OF OTOLOGY. By Charles Edwin Perkins, M.D. Lea & Febiger, Philadelphia, 1916. Price $3.00.

In the fourteen chapters which this little book contains the author describes the various diseases and changes in function which are connected with the auditory apparatus, and gives directions as to how they are to be treated, both by the general practitioner and the specialist. As the volume contains less than four hundred and fifty pages it is not as exhaustive as some of those which have appeared in medical literature within

recent years, but it is an efficient working manual for the active practitioner and the youthful otologist. The author, having been engaged in the teaching of otology and active otological practice for a number of years, is well qualified to sift out the essentials of his subject and to present them in an admirable way to the reader.

THE PRACTICAL MEDICINE SERIES. Edited by Charles L. Mix, A.M., M.D. Volume 3. The Eye, Ear, Nose and Throat, Edited by Casey A. Wood, M D., Albert H. Andrews, M.D., and George E. Schambaugh, M.D. The Year Book Publishers, Chicago, 1916. Price $1.50.

The intent of the Practical Medicine Series, as our readers know, is to present a summarization of the literature from different fields of medicine for the year. This volume, therefore, contains brief abstracts of articles of importance which have appeared in various journals devoted to the subjects of which they treat. The present volume is very freely illustrated with plates, and the names of the editors indicate that the best of current medical literature receives attention.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by L. F. Appleman, M.D. Volume Three, September, 1916. Lea & Febiger, Philadelphia, 1916.

The contributors to Volume Three of Progressive Medicine are: Edward P. Davis, M.D., Professor of Obstetrics in the Jefferson Medical College, who contributes a long and exhaustive summarization of Obstetrical Literature of the past twelve months; Dr. William Ewart, of London, who deals with Diseases of the Thorax and its Viscera in an article of about ninety pages; Dr. William S. Gottheil, of New York, who gives us an excellent summary of literature concerning Dermatology and Syphilis; and Dr. William G. Spiller, who, in about sixty pages, sums up the neurological literature of the year gone by. Each of these men is widely known as an authority; each of them has large clinical experience; and each is, therefore, qualified to pick up from literature the most important facts and to discuss and criticize them in such a way as to add interest and usefulness to the information which is given. Illustrations are to be found where they are necessary to illuminate the text.

THE CARE AND FEEDING OF INFANTS AND CHILDREN. A Text-book for Trained Nurses. By Walter Reeve Ramsey, M.D. Including Suggestions to Nurses by Margaret B. Lettice and Nann Gossman. Illustrated. J. B. Lippincott Co., Philadelphia, 1916. Price $2.00.

The very large number of small books which have been published during the last ten years for the use of nurses, in training and after training, makes one wonder that there should be such a demand for literature of this character. In some instances we have called attention to the fact that the volumes were too technical and too advanced for the ordinary trained nurse, and have expressed regret that the tendency seemed to be to teach nurses medical science rather than practical measures for the relief of those who are sick. That there is a field, however, for a book of this character cannot be doubted. Indeed, it may be said to be the first volume which is essentially a nurse's manual on the care of children. It is copiously illustrated with 122 pictures, and much valuable information is given to the nurse as to how she can help the mother take care of the child. A number of tables, in various places, give a great deal of condensed and useful information. Some of these are taken from other authors, and, possibly, one of the most useful is that quoted from Preyer giving the times at which the different bodily movements are developed in infants, points which the anxious and inexperienced mother is all too prone to ask about when she calls a trained nurse to her assistance.

THE MEDICAL CLINICS OF CHICAGO. Volume I, No. 6, May, and Volume II, No. 1, July, 1916.

The design of this publication, as we have pointed out on previous occasions, is to provide the practitioner with the information he might get were he so fortunate as to be able to devote a considerable amount of time to attending clinics given by various

medical men connected with hospitals in this western city. All of the clinicians are men who are actively engaged in hospital work, and we presume that in each instance they have had the opportunity to revise and correct the reports of their clinical lectures. A very wide field of clinical medicine is covered, including therapeutics, children's diseases, and certain states which are on the border-line of surgery, or, at least, in which the surgeon frequently has to come to the assistance of the physician.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month the abnormal atmospheric conditions have continued. Instead of fine, hot weather there have been downpours of great intensity, though luckily only lasting a few hours, mingled with periods of mild showers. Luckily the first fortnight was fine and warm, so that the crops had a good chance of ripening, and I am informed that up to the present no harm has come to the corn. The greater part of the corn has been cut, but not yet carted. The summer has been so abnormal that many people have not taken the trouble to put up their sun-blinds, and their absence has been noticeable.

There is again very little true medical news to report. Sickness amongst the troops is not prevalent, and most of the military hospital beds are occupied by those wounded in the course of the recent operations in Flanders. The general characteristics of the wounds are similar to those of the preceding periods, and there have been no radical alterations in the methods of treatment. In one of the recent numbers of the *Lancet* was a short but interesting article by Morrison of Newcastle, who has been using a mixture of iodoform and bismuth emulsified with paraffin for applying to perforated wounds, and reporting considerable success with this method. The method has also been tried at one of the London hospitals and good results are reported. One great advantage is that a wound so treated requires much less dressing than those treated by other methods, thus rendering the work of the hospital staff less onerous than where dressings have to be changed several times a day. It will be remembered that Sir Watson Cheyne made an effort to introduce a somewhat similar method during the autumn of 1914, which was adversely reported upon by the Royal Army Medical Corps, possibly owing to a trial which was not sufficiently extensive and not carried out intelligently. It will be interesting to see if this new method will be given a further trial, and how it will succeed when in hands other than those of the originator. I understand from many of those who return from the front that at the end of the war there is likely to be considerable criticism of the methods which have been employed for the treatment of these wounds.

Now that the nights are beginning to lengthen, more Zeppelin raids are expected. In spite of the danger attached to the dropping of bombs, these raids are still regarded more in the light of spectacular incidents than as real elements of danger, and few cases are met with attributing their illnesses to the bombs. I have met with two cases of chorea, the origin of which was stated by the parents to be fright on the night of one of the raids, but nothing in the behavior of the patients suggested that the disease was anything out of the ordinary. A number of elderly patients also state that their ailments originated in fright resulting from a raid. Their relatives state that they have never quite been the same since that time, and that a general failing of mentality has ensued. I met with one case of a well-known legal gentleman whose domicile was within a few yards of the spot where a bomb

fell. All the windows of his house were smashed, at a time when he was preparing to go to bed. He was considerably frightened and very nervous for a week or more, but then apparently recovered. He had, however, steadily gone downhill from that time, with loss of weight and inability to concentrate, eventually dying from some very indefinite cerebral condition, with which none of the ordinary causes could be associated. He died about eleven months after the night of the raid. For about a week prior to his death he had been delirious at night, and in his delirium constantly referred to bombs, broken glass, and so forth. He had declared that he had ceased to think about the raid, but there is probably some connection in this case. Bombing is becoming a more or less common term, in so much as a few days ago I heard a child of six or seven telling a gate which would not open that he would drop a bomb on it.

In connecton with airship raids a new lighting regulation has been promulgated, and will come into force on September 1. Under this regulation both street lighting and the lighting of private houses will be more restricted than up to the present. The restrictions seem to be chiefly directed against shop lighting. In some of the districts of London where a good deal of shopping is done at night, powerful lights are employed, throwing their beams on to the shop and on to the pavement in front. No lights are to be employed which throw a light on to the pavement. No lights in private houses will be allowed of such a strength that they illuminate the houses opposite. Stringent lighting regulations seem to be the best defense against Zeppelin raids, and I am informed that Norwich owes its immunity from attacks to the strictness of lighting regulations. The latter are so strict that it is not allowable to light a cigarette in the street after nightfall. In spite of the German communiqués, Norwich has never been touched by bombs, though apparently frequent attempts have been made to injure this country town.

I have in previous letters described the free meals which have been provided by the school authorities for children. Such is the prosperity of this class at the present time that it is not now necessary to provide meals on Saturdays and Sundays, and the numbers provided on other days have been reduced by half as compared with those required in previous times. In connection with the children, it is further interesting to notice that this year there has been less infantile diarrhea than is usually the case at this season. No doubt this is largely due to the absence of long spells of dry and hot weather, but to a certain extent it must be attributed to the fact that fewer mothers are going out to earn wages, and possibly to the establishment of a large number of crèches, in which the mother, should she be obliged to go out, can leave her child. More clinics for children are also being established, and are under the supervision of the local authorities. These clinics do not lay themselves out to treat the affected children, but to give advice to the mothers, which advice is largely of a prophylactic character. Thus in the case of diarrhea the mother would be instructed as to sterilizing and preserving the sterilized milk, and only the simplest treatment would be given. She would further be warned that if the condition did not improve the child should be taken to one of the children's hospitals, where special treatment is carried out for this condition. Some of the children's hospitals open special departments during the summer to cope with these cases, but do not open until a certain fixed number attend the casualty department on any given day. This year the number has been so small that few of these departments have been required.

About a year ago a number of cases of anthrax, the primary lesion being on the face, were notified. After some little investigation the cause was traced to cheap shaving brushes, the hairs of which were found to be infected. In the last few weeks several more cases have been reported, and consignments of cheap shaving brushes made with pig's bristles were confiscated.

We are, however, not told from whence these consignments were derived.

Owing to the war the annual inter-hospital athletic competitions have naturally been abandoned, so that I have no results of such competitions to record.

I cannot close this letter without referring to the deep sympathy which is felt on this side for those cities affected by the epidemic of infantile paralysis. Some little anxiety has been expressed lest the epidemic should spread to this country. This does not appear likely, and we hope that the opportunity will be seized to trace the mode of infection of this disease.

WANDERING TAPEWORM.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: I am enclosing the history of a case of wandering tapeworm (*Tænia saginata*) which because of the peculiar findings and the few cases reported I feel is worthy of printer's ink.

L. M. B., female, single, aged thirty-two, always enjoyed good health. The five years previous to December, 1914, she spent in Winnipeg, Man., as telephone operator and domestic. Since that time until she had to give up work she was engaged as chambermaid in one of the hotels of this city. Two weeks before leaving the hotel she began to have pain on the crest of the right ilium, and this became so severe that a physician was summoned, who administered hypodermics of morphine to relieve the pain. This was necessary on several occasions; in all six or seven injections were made into the gluteal muscles. This relieved the pain but temporarily. At first the condition was thought to be rheumatic in nature, and later a tubercular infection was suspected. The patient denied having injured the affected part in any way. On March 25, 1915, eight weeks after the onset of the pain, she came to my office for treatment.

The patient was well nourished, walked with gait favoring the right hip, but did not complain of pain on suddenly and forcibly jarring over the trochanters on the affected side, or on the manipulation of the femur, but pressure over the middle and posterior two-thirds of the crest of the ilium caused pain; further examination revealed a discolored, prominent, fluctuating area several inches in diameter over the sacroiliac joint in its superior portion. An abscess was diagnosed, and with a large aspirating needle a drop of thick pus was obtained. The patient, not being able to bear the expense of hospital care, returned to my office the next morning, and under chloroform anesthesia I opened the abscess and evacuated about four ounces of thick pus with a characteristic colon bacillus odor. The abscess cavity was not explored at this time, but next day I found it to extend forward along the posterior two-thirds of the crest of the ilium and occupying the entire space between the posterior and middle gluteal lines. At the time of operation I did not think there was anything unusual except the odor of the pus, a specimen of which I now regret that I did not save for laboratory diagnosis.

One week later one can imagine my surprise, while dressing the wound, to express out a segment of tapeworm, and during the following eight days fifteen more segments passed from the wound, some living, others dead on the dressings. During this period I injected into the cavity of the abscess 10-per-cent argyrol, 5-per-cent protargol, tr. iodine and tr. benzoin, on successive days. On March 26 the abscess was opened and drained; on April 2 the first segment was expressed from the wound; and on the 8th, without any internal medication, the patient passed 17 feet of tapeworm from the bowel.

The unusual features of the case were the sudden onset with pain in the crest of the hip-bone, the patient never having experienced any abdominal or intestinal symptoms at any time previous or since; the character of the odor of the pus at the time of evacuation without the presence of fecal discharge; the number of individual segments which were extruded from the wound, which was situated over the sacroiliac notch, so that the distance from the anus would rule out wound contamination.

The question is, then, how did the parasite become lodged in this position? I have found but one reference which stated that the tapeworm had been found in other organs outside of the bowel, being forced into them probably in the act of coughing or vomiting or like manner. Cases have been reported where extrusion has taken place through inguinal and umbilical fistulæ and from the bladder due to the presence of a rectovesical fistula, and also into vagina by rectovaginal fistula. In this case there was absence of abdominal symptoms, or of a sinus communicating with the bowel, but a colon-bacillus odor from the pus evacuated. I am inclined to believe that there must have been some communication with the bowel which had healed, but which I failed to find.

The patient was last seen in the office April 27 with the wound entirely healed.

ALFRED DEAN, M.D.

GRAND FORKS, N. DAK.

CANNABIS INDICA.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: The interesting article by Dr. Charles W. Burr in your issue of August 15 leads me to give a summary of my experience. I have used cannabis indica considerably, in fact almost as a routine, to diminish pain and check secretion in hyperchlorhydria. For the former purpose it has seemed quite efficient; as to the latter, it has not been possible to discriminate between the direct action of this drug and dietetic and neutralizing measures employed conjointly. For several years, up to about fifteen years ago, cannabis indica as found on the market was very unreliable, and the dosage of any particular preparation had to be determined experimentally. About this time, at the suggestion of Dr. W. H. Woodbury, I began using an imported English extract, for convenience making a one-per-cent alcoholic solution. For about ten years I have used P., D. & Co.'s and a few other American galenicals, and have found them satisfactory.

Especially for a short period after changing from unreliable to active preparations, and occasionally since, on account of variability in susceptibility, voluntary increase or repetition of dose by patients, etc., I have seen quite a good many cases of intoxication, probably twenty at least. With one exception seen quite recently, I have never observed nor obtained by leading questions a history of disturbance of time and space relations so graphically described by H. C. Wood. Nor have convulsions, loss of consciousness, or serious disturbance of intelligence, stupor beyond moderate drowziness, or notable disturbances of any visceral function been observed. With the exception noted, the sole symptom of intoxication has been anxiety and subjective feeling of danger from the drug, often amounting to apprehension of a fatal result and sometimes to an acute fear of death. Anxiety, though not amounting to fear of death, was a marked symptom also in the single case with disturbance of time and space relations. The patient, a prominent member of an allied profession, while walking home, a mile or so, felt that the distance of each block was interminable. So far as I could get at the exact mental state, there was no fear of physical inability to get home, but merely the growing weariness, more psychic than physical, and the beginning of an obsession that one must arrive at the destination that most of us experience on any kind of a journey on foot, bicycle, in an auto, or even on a train, when it becomes extremely long drawn out. Many of the cases were, of course, seen during the period at which anxiety was most marked. In none was there any objective evidence of cardiac, respiratory, or other failure of vital function, nor could the patient explain subjectively why anxiety was felt or locate the reason for anxiety. The cases, indeed, reminded me of a type of seasickness which I have personally experienced, in which there is intense subjective discomfort, but without pain or any other local symptom—not even excepting vomiting—to explain the psychic condition. However, in seasickness there is really a state of shock, probably due pretty directly to mechanic traction

on the pneumogastric, by reason of the inertia of the liver, movable kidneys, etc.

Very truly yours,

A. L. BENEDICT, M.D.

BUFFALO, N. Y.

THE CORRECT ANALYSIS OF HORLICK'S MALTED MILK.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: We note that you quoted in the Progress columns of the July issue of your journal an article by Dr. F. W. Howe on "The Chemistry of Cow's Milk and Other Products Used in Infant Feeding," which appeared in the January issue of the *Archives of Pediatrics*, and we desire to call your attention to the fact that the article by Dr. Howe, as it was originally published and quoted, gave an incorrect analysis of Horlick's the Original Malted Milk, inadvertently taken from the early edition of Dr. Holt's book.

In the March issue of the *Archives of Pediatrics* Dr. Howe, on discovering the error, published a corrected analysis of Horlick's Malted Milk, which is as follows:

	Nestle's Food.	Mellin's Food.	Eskay's Food.	Malted Milk (Horlick's).	Ridge's Food.	Imperial Granum.	Lacto Preparata.	Carnrick's Food.
Fats	% 4.45	% 0.24	% 1.16	% 8.78	% 1.11	% 1.04	% 12.35	% 7.45
Proteids	11.47	11.50	5.82	16.35	11.81	14.00	14.51	10.25
Cane sugar	29.22							
Dextrine	6.22	19.20	14.35	18.80	1.28	1.38		
Dextrose								
Lactose (milk sugar)	15.95		53.46		0.52	0.42	63.68	
Maltose		60.80		49.15				
Total soluble carbohydrates	51.39	80.00	67.81	67.95	1.80	1.80	63.68	27.08
Insoluble carbohydrates (starch)	28.43		21.21	3.86	76.21	73.54	3.06	37.37
Inorganic salts	1.73	3.59	1.80	3.86	0.49	0.39	3.06	4.42
Moisture	2.58	4.73	2.70	3.06	8.58	9.26	5.80	3.42

From this it will be noted that our product contains no starch, and that the fat content is 8.78, and not as erroneously printed. We bring this matter to your attention, as we feel you will want to give your readers the benefit of this corrected statement, in the next issue of your journal.

Very truly yours,

HORLICK'S MALTED MILK COMPANY.

NOTES AND QUERIES.

SHIPMENT OF POISONOUS DRUGS BY MAIL.

The *Boston Medical and Surgical Journal* of September 14, 1916, calls attention to the fact that there has recently been introduced in the United States Congress, at the instance of the National Association of Manufacturers of Medicinal Products, a bill to amend Section 217 of the United States Criminal Code relating to the shipping of poisonous substances by mail. This bill (Senate 6834, House 17396) is known as the Kern-Doremus Bill, from the names of its proponents in the two houses. The present section of the Criminal Code above referred to forbids absolutely the transmission of poisonous drugs, even for legitimate purposes, by mail. This prohibition may prevent the mailing of emergency preparations ordered by physicians from a distance by telephone or telegraph. It has seemed to the advocates of the Kern-Doremus Bill that this article should be amended so as to exclude only drugs not outwardly or of their own force dangerous to life, health, and property, and to permit the shipping by mail of poisonous drugs not thus dangerous if securely and properly prepared and packed, so as not to endanger the mails or those handling them from leaking or breakage. In accordance with this feeling the new bill has been drawn in part as follows:

"Sec. 217. All kinds of poisons and all articles and compositions containing poisons which are outwardly or of their own force, dangerous or injurious to life, health or property; and all other poisons, and articles and compositions containing poisons so in-

securely packaged as to endanger the mails or those handling them from leakage or breakage; all articles and compositions herein described that are not packaged and prepared for the mails in accordance with any regulations that may be made by the Postmaster-General for their preparation and packing; and all poisonous animals, insects, and reptiles, and explosives of all kinds, and inflammable materials, and infernal machines, and mechanical, chemical, or other devices or compositions which may ignite or explode, and all disease germs or scabs, and all other natural or artificial articles, compositions, or materials of whatever kind which may kill, or in any wise hurt, harm or injure another, or damage, deface, or otherwise injure the mails or other property, whether sealed as first-class matter or not; and all spirituous, vinous, malted, fermented, or other intoxicating liquors of any kind are hereby declared to be non-mailable matter and shall not be conveyed in the mails or delivered from any post-office or station thereof, nor by any letter carrier."

The remainder of the bill provides penalties for violation of these provisions. The Postmaster-General is empowered to make suitable regulations respecting preparation and packing for the mails.

The intent of this proposed amendment seems just, and the bill in question has been indorsed by the American Pharmaceutical Association and the American Association of Pharmaceutical Chemists. Its discussion and further consideration will presumably be postponed until the next session of Congress.

THE WEASEL IN MEDICINE.

The *Boston Medical and Surgical Journal* of September 21, 1916, tells us that Mr. Philip Hale has recently called attention to the description given in Edward Topsel's "History of Four-footed Beasts and Serpents" (London, 1658) of the medicinal uses that were made of the weasel in the spacious Elizabethan days and thereafter, as late as the restoration. The following is the remedy recommended for gout:

" 'Take a little young whelp alive, well fatted, and a living weasel in nine pints of Oyl, and unto the same two or three pounds of butter and boyl them together until the beasts be made lank or lither, and then put your hands or feet a whole day in hot Oyl well strained.' It would be easier, continues Mr. Hale, to put weasel powder in wine; this would also be efficacious in epilepsy, the headache, and in case you were bitten by a scorpion; also for palsy or shaking of the joints; 'very effectual for the expelling or taking away of the pin and web in the eyes'; it helps all sores and impostumes. Some recommend the brain of a camel mingled with those of the weasel. If an ox or horse is stung, stroke the wounded place with a weasel skin. If you are bitten by a weasel, apply onions and garlic externally or in sweet wine.

"Two remedies should here be given in full. The powder of a weasel being mingled with the blood of a young swallow doth heal the quinsie or squinzie. 'The same is also very effectual for the expelling of wens or bunches in the body. The same diseases are both healed by this medicine, to burn a living weasel altogether in an earthen pot, and to mingle with the powder thereof Honey, Turpentine and Butter of each a sufficient quantity, and in the manner of an Oyntment to apply it unto the bodies of the grieved parties.'

" 'There is a speedy remedy for the driving away of rheum in the head, and the Catarrh swelling by rheum in the jawes, which is this: To take a Weasel upon a Thursday in the old Moon, and put him alive in an unburned pot, that in the Boyling he may be torn, and dryed into powder, which powder being gathered together and well tempered with Honey, to give it to the diseased person every day in a spoon fasting, to the quantity of three drams, and it will in short space wonderfully ease him.'

"These remedies, Mr. Hale pertinently observes, were prescribed by the wisest ancients. They were soberly advised in 1658. What will men and women of 2158 say to the treatment and prescriptions of 1916?"